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Essays on School-to-Work Transitions

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Abstract

This doctoral thesis addresses policy measures implemented to improve school-to-work transitions of secondary school students in Germany, focused on students of the lower and middle track.

Chapter 2 provides a survey of the economic research on vocational education. We find that research gaps still exists regarding young school-leavers and long-term labor market outcomes. We present selected results of a case study evaluating short-term effects of additional career assistance. Considering the research gaps we describe the concept for a regionally clustered transition panel.

Chapter 3 analyzes based on own survey data the take-up of career guidance activities in secondary school and their effect on career planning. Take-up of career guidance depends upon the school track attended, and the school and the class setting, while personal characteristics are barely relevant. The effects of counseling depend upon the type of counseling provider.

Chapter 4 assesses the effect of additional career assistance (ACA) on medium-term labor market outcomes of lower secondary school students. We find evidence for a delay in the transition into and completion of vocational training. Despite the delay, there is no difference in drop-out probability or the type of vocational training. But we find small negative effects on employment and cumulative earnings within six years after school. ACA participants also spend more time in unemployment.

Chapter 5 analyzes alternative transition paths after German lower track secondary school in their effect on the type of vocational training. I show that a delayed transition into vocational training is not a disadvantage. However, economic benefits from continuing schooling come at the cost of being less satisfied with the vocational training. Participation in pre-vocational training does not lead to a different type of vocational training position than after a direct transition, but to lower levels of satisfaction.

Zusammenfassung

Diese Dissertation befasst sich mit staatlichen Maßnahmen zur Verbesserung des Übergangs Schule-Beruf von Schülerinnen und Schüler der Real- und Hauptschulen in Deutschland.

Kapitel 2 gibt einen Überblick über die ökonomische Berufsbildungsforschung. Wir stellen fest, dass noch Forschungslücken bezüglich junger Schulabgänger und langfristigen Arbeitsmarktergebnissen bestehen. Es werden ausgewählte Ergebnisse einer Fallstudie zu kurzfristigen Effekten einer Berufsorientierungsmaßnahme vorgestellt. Angesichts der noch bestehenden Erkenntnislücken skizzieren wir ein Konzept für ein regional geclustertes Übergangspanel.

Kapitel 3 analysiert auf Basis eigener Befragungsdaten die Teilnahme an Berufsorientierungsmaßnahmen an weiterführenden Schulen und ihre Wirkung auf die Berufsplanung. Die Teilnahme hängt vom Schulzweig, sowie vom Schul- und Klassenkontext ab, während persönliche Merkmale kaum relevant sind. Die Wirkung von Berufsberatung hängt vom Anbieter der Beratung ab.

Kapitel 4 untersucht die mittelfristige Wirkung einer Berufsorientierungsmaßnahme auf Arbeitsmarktergebnisse von Hauptschülerinnen und -schülern. Wir beobachten eine Verzögerung beim Eintritt und Abschluss der Berufsausbildung. Trotz der Verzögerung bestehen keine Unterschiede bei der Abbruchwahrscheinlichkeit und der Art der Berufsausbildung. Aber wir finden kleine, negative Effekte auf Beschäftigung und kumulative Verdienste innerhalb von sechs Jahren nach der Schule. Teilnehmende verbringen auch mehr Zeit in Arbeitslosigkeit.

Kapitel 5 analysiert die alternativen Übergangswege nach der Hauptschule in ihrem Effekt auf die Art der Berufsausbildung. Ich zeige, dass ein verzögerter Übergang in Ausbildung kein Nachteil sein muss. Allerdings stehen die ökonomischen Vorteile einer geringeren Zufriedenheit mit der Berufsausbildung gegenüber. Die Teilnahme an Berufsvorbereitenden Maßnahmen führt nicht zu einer anderen Art der Ausbildung als der direkte Übergang, aber zu einer geringeren Zufriedenheit.

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1 Introduction and Summary

Particularly in the context of high youth unemployment in other European countries, the German youth labor market has been perceived as a role model (Berlingieri et al., 2014; OECD, 2014). Low youth unemployment and smooth labor market integration of youth are observed and credited to the dual vocational education system. But the system does not work for everyone. Lower skilled school-leavers are confronted with a difficult vocational training market competition. Many occupations demand a more complex vocational training (Protsch, 2014), which leads employers to question the sufficiency of trainability and skill level of school-leavers of lower track secondary schools[1] for those occupations. A larger share of adolescents reaches the higher education entrance qualification, but still enters the vocational training market (BMBF, 2016). By choice or due to the lack of alternatives, only the minority of lower track secondary school-leavers transition directly into vocational training.

Policy reactions to this development have been observed with regard to education and labor market policy. One of them is the expansion of opportunities for lower track secondary school students to upgrade their secondary school qualification to a middle track secondary school qualification. Depending on the state's educational policy lower track secondary schools offer classes up to grade 10 or vocational schools offer programs that reward the middle track secondary school qualification. These educational policies meet the higher educational aspirations of many adolescents.

Another policy reaction is the development of a 'transition system' ("Übergangssystem"), a wide range of pre-vocational training programs offered to students that do not have the potential to reach a higher secondary school qualification, but are not or do not feel ready to start a vocational training. Most states have compulsory schooling until age 18, which can be fulfilled either at general schools or vocational schools (full-time or part-time schooling during an apprenticeship), including pre-vocational programs. Thus school-leavers have to participate in pre-vocational training if they do not attend school in some other form. In 2014 roughly 253,000 young individuals started a pre-vocational training program (Statistisches Bundesamt, 2015), provided either by vocational schools or educational providers financed by the employment agency.

The individual's investment in human capital is a fundamental decision affecting the individual's labor market outcomes. The decision on human capital investment is complex because it has to be made under uncertainty and incomplete information regarding own and necessary skills, expected returns to both general and vocational education, and labor demand, for example for workers in specific occupations. The expansion of educational upgrading opportunities and alternative transition paths into vocational training has increased the number of options individuals need to consider in their career planning.

[1] The German three-tier secondary school system is traditionally supposed to prepare students in the lower track ("Hauptschule") until grade 9 for vocational training in crafts, trades, and service occupations with low to moderate requirements. Students in the middle track ("Realschule") are also prepared for vocational training, but remain in school until grade 10 and thus qualify for more complex occupations. Upper track secondary schools ("Gymnasium") prepare for higher education until grade 12 or 13, but they may also enter vocational training after graduation.

In the German context this complex decision has to be taken by low skilled school-leavers at a particularly young age of 15 or 16. At this age they not only need to decide on the educational path they want to take, but also in which occupation they want to work. Research in behavior economics suggest that it is particularly unlikely to form a rational human capital investment decision at this age (DellaVigna, 2009; Golsteyn et al., 2014; Goux et al., 2015; Koch et al., 2015; Lavecchia et al., 2016). Unrealistic aspirations and choice avoidance might drive decisions which delay the school-to-work transition.

In order to support adolescents with the decision process on their school-to-work transition, career guidance activities have been intensified by all policy levels. Career guidance includes a wide range of activities such as provision of information on occupations, for instance as part of the school curriculum, support for writing applications, job shadowing, work experience placements, and individual counseling and mentoring. Key players are the employment agency, providing information and counseling, and schools, offering occupational orientation curriculum, work experience placements, and application support. There exist many additional career assistance activities by a variety of players, many of them initiated on the local level.

This doctoral thesis addresses policy measures implemented to improve school-to-work transitions of secondary school students, focused on students of the lower and middle track. It consists of four chapters which are self-containing and can be read independently.

Chapter 2 serves as an extended introduction and overview of the research topic and is joint work with Holger Bonin and Bernd Fitzenberger. We provide a survey of the very dynamically developing literature in economic research on vocational education. We summarize the already quite broad literature on the firm's perspective on vocational training. The literature shows that labor market frictions make firms employ apprentices and carry part of the training costs. It remains an open research question why firms decided to train or not train in the same institutional framework and labor market. Expected returns to vocational training are likely to drive the individual's decision to start a vocational training. However, the estimation of returns to vocational training still is not completely resolved, particularly comparing the returns of vocational education and general education. While the so far estimated returns to vocational education seem comparable to general education and some studies claim that general education provides advantages over the life cycle, it remains an open question whether cohort effects and selection effects over the school career drive the results. Most of the recent research in this field analyzes the decision behavior of adolescents. Behavioral economic considerations indicate that the decision process at this young age is likely to be biased. Career guidance activities should support youth in the school-to-work transition. In the literature survey we find that research gaps still exists regarding young school-leavers and long-term labor market outcomes. We present selected results of a case study in Southwest Germany evaluating short-term effects of additional career assistance. The case study describes the patterns of career planning and finds that additional career assistance leads to a reverse of educational plans for some subgroups. Considering the still existing research gaps we describe the necessity of meaningful panel data and outline a concept for a regionally clustered transition panel.

Chapter 3 analyzes the take-up of career guidance activities in secondary school and their effect on career planning and is joint work with Bernd Fitzenberger and Maresa Sprietsma. Based on a survey conducted in secondary schools in Germany, we analyze career guidance activities and how these affect career plans. The take-up of career guidance depends upon the school track attended, and the school and the class setting, while

personal characteristics are barely relevant. We consider career guidance counseling by school counselors and by the employment agency separately as well as work experience placements. We find that the school setting, in particular the level of participation at class-level are strong determinants of individual take-up of career guidance counseling and work experience placements. The matching quality of work experience placements is hardly affect by school characteristics, but by the students' own search activities or their family's support. We assess the level of career planning by the probability to report a desired occupation, to have applied for an apprenticeship, and to plan upgrading of the secondary school qualification. The effects of counseling on career planning depend upon the type of counseling provider and differs by school track. For lower track secondary school students, counseling by the employment agency reduces plans for educational upgrading and increases the probability of applying for an apprenticeship and reporting a desired occupation. Counseling by school counselors for lower track secondary school students only weakly increases the probability to report a desired occupation. Counseling by the employment agency for middle track students also increases the probability to report a desired occupation and apply for apprenticeships, the plan to continue schooling is not affected. For middle track secondary school students, the number of work experience placements and their matching quality are positively associated with career planning towards apprenticeships and negatively associated towards the continuation of schooling. In sum, the employment agency seems more effective than school counseling in supporting career planning aimed at entering the labor market through an apprenticeship.

Chapter 4 assesses the effect of additional career assistance on labor market outcomes in a case study and is joint work with Bernd Fitzenberger and Gerrit Müller. Using unique data linking survey data with administrative school and integrated employment biography data, we apply a control group approach to identify the effect of a program providing additional career assistance (ACA) offered to lower track secondary school students in the last two years of school on the labor market entry. The labor market entry in the short-term is described by the probability to start a vocational training, to drop out of the vocational training within the first year, and to complete a vocational qualification within 6 years after grade 9. Additionally, the difference in the type of vocational training is assessed by the starting wage paid during the vocational training, the prestige, socioeconomic status, and average wages of the vocational training occupation. Finally, the medium-term labor market outcomes within six years is measured by cumulative days in employment, unemployment, and active labor market policy as well as cumulative earnings. The additional career assistance has no effect on the overall transition rate into vocational training and the probability to complete a vocational qualification within six years after grade 9. But analyzing the treatment effects over time, we find evidence for a delay in the transition into and completion of vocational training. ACA participation also does not result in a difference in drop-out probability or the type of vocational training. Thus it seems unlikely that the delay enabled ACA participants to reach vocational training positions of higher quality. But we find negative treatment effects on employment and cumulative earnings within six years after grade 9. ACA participants also spend more time in unemployment. These effects are small as they accumulate over six years, but are still an undesired effect of a career guidance program. Examining heterogeneous treatment effects we find that only little effect heterogeneity by migratory background, but more by gender. Treatments effects are larger, and more negative for men.

Chapter 5 moves on to transition paths after school and analyzes alternative transition

paths after grade 9 of German lower track secondary school in their effect on the type of vocational training. I show that a delayed transition into vocational training after lower track secondary school is not a disadvantage conditional on a successful transition into vocational training. Students benefit from continuing general schooling or attending vocational school compared to transitioning directly with regard to wages paid during vocational training as well as average wages, prestige, and socioeconomic status of the training occupation. This comes at the cost of a lower probability to match the training occupation with the reported desired occupation and being less satisfied with the vocational training. The analyses on effect mechanisms show that upgrading of secondary school qualification plays an important role for the positive effects of a delayed transition, but it does not explain the entire effect of general and vocational school. Particularly, attending vocational school seems to be beneficial independent of upgrading the secondary school qualification as the effects differ only little. Participation in pre-vocational training does not lead to a different type of vocational training position than a direct transition. However, those participants are less satisfied with their vocational training. The particularly low levels of satisfaction with their vocational training of former participants of pre-vocational training seem to be driven by those from states where pre-vocational training is a relatively common transition path and those not upgrading their secondary school qualification. Equivalently, after continuing general school without a higher secondary school qualification adolescents are less satisfied with the vocational training. Disappointment of not being able to improve their labor market opportunities and reach the desired occupation might be an explanation for the observed effects.

I show in this doctoral thesis that career guidance measures for secondary school students at the school-to-work transition do have an impact on career planning and even on medium-term labor market outcomes. It seems, however, that provider and implementation are crucial for the direction of the impact. Counselors of the employment agency are more effective in advancing transitions into vocational training, while school counselors of local initiatives tend to support more educational upgrading. This is confirmed by the reversal of plans for subgroups and the delay of vocational training caused by ACA. On the one hand, the ACA impact on medium-term labor market outcomes suggest that this is not a positive effect. On the other hand, Chapter 5 shows that a detour can pay off, at least economically. Considering the trade off with satisfaction and drop-out rates, well tailored counseling seems to be important to support the students to identify their preferences and most suitable path. There is still room for research on the long-term effects both of career guidance activities and transition paths. This doctoral thesis shows as well that more and extended data is necessary to cope with the econometric challenges of research on school-to-work transitions. School-to-work transitions are very dynamic processes including selection at each step on the way, which is difficult to account for considering the available data. For instance, regionally clustered transition survey panel data needs to be linked with administrative school and labor market data. Policy recommendations based on this doctoral thesis would be to invest in well tailored, personal career guidance counseling for students of all school types. Counselors need to support the formation of realistic aspirations and identification of suitable transition paths and occupations. Counseling should also include support with identifying and realizing matching and helpful work experience placements. Both Chapter 3 and 5 suggest that much more the quality than the quantity of the work experience placements are relevant for the school-to-work transition. So far most of policy and effort seems to be focused on the quantity.

2 Schule – Berufsausbildung – Arbeitsmarkt: Herausforderungen und Potenziale der ökonomischen Berufsbildungsforschung *

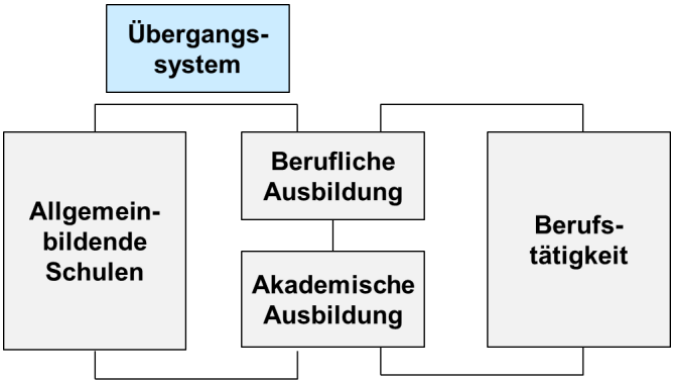
2.1 Probleme der beruflichen Ausbildung in Deutschland

Deutschland hat eine im internationalen Vergleich niedrige Jugendarbeitslosigkeit. Dazu leistet das duale Ausbildungssystem einen wichtigen Beitrag (vgl. Berlingieri u. a., 2014; OECD, 2014; Riphahn und Zibrowius, 2016). Dennoch zeigen sich verschiedene Probleme in den Übergangsprozessen, die junge Menschen zwischen allgemeinbildenden Schulen, beruflicher oder akademischer Ausbildung sowie dem Einstieg in den Beruf durchlaufen (Abbildung 2.1). Für diese gilt es adäquate Lösungen zu erarbeiten, um die Fachkräftebasis in einer alternden Gesellschaft zu sichern.

Auf der einen Seite gelingt es einem erheblichen Teil der jungen Menschen nach dem Ende des Besuchs der allgemeinbildenden Schule nicht, reibungslos in eine berufliche Ausbildung einzumünden und diese auch erfolgreich abzuschließen. Daran hat auch durch die sehr günstige allgemeine Arbeitsmarktentwicklung in Deutschland nichts Entscheidendes geändert. Die Anforderungen an Auszubildende in vielen Ausbildungsberufen sind gestiegen (vgl. Protsch, 2014). In Folge dessen wird ein steigender Anteil der Ausbildungsplätze mit Studienberechtigten besetzt (BiBB, 2015). Etliche Unternehmen klagen über eine unzureichende Ausbildungsreife und Berufsorientierung vieler Jugendlicher, und in Teilen der Wirtschaft zeigt sich eine sinkende Ausbildungsbereitschaft. Rund 21.000 Jugendliche fanden im Ausbildungsjahr 2015 keine Lehrstelle. Weitere 60.000 begannen eine Alternative zu einer beruflichen Ausbildung, zum Beispiel einen Bildungsgang im Übergangssystem oder ein Praktikum, blieben aber auf Ausbildungsplatzsuche (BMBF, 2016).

*Dieses Kapitel ist eine gemeinsame Arbeit mit Holger Bonin (IZA) und Bernd Fitzenberger (IAB, HU Berlin) und wurde 2016 in Perspektiven der Wirtschaftspolitik 17(3), S. 208–231, DOI: 10.1515/pwp-2016-0019 veröffentlicht. Wir danken der Baden-Württemberg Stiftung, die im Rahmen ihres Programms Netzwerk Bildungsforschung die Projekte „Übergänge am Ende der Sekundarstufe 1 in weiterführende Schulen und die berufliche Bildung an ausgewählten Standorten in Baden-Württemberg“ und „Machbarkeitsstudie für das Baden-Württemberg-Panel“ in Auftrag gegeben hat, deren Ergebnisse hier in Teilen einfließen. Für hilfreiche Diskussionen bedanken wir uns bei Stefanie Lickleder und den Mitgliedern des Netzwerks Bildungsforschung. Weiterhin dankt Bernd Fitzenberger für die finanzielle Unterstützung der Albert-Ludwigs-Universität Freiburg und des Ministeriums für Wissenschaft und Kunst in Baden-Württemberg im Rahmen des Projekts „Die Wirkung des Bildungssystems auf den Übergang von Schule in Beruf – Evaluation des Pilotprojekts Erfolgreich in Ausbildung“ (Nr. 31-7532.20/068). Die Verantwortung für diesen Beitrag liegt alleine bei uns; er spiegelt nicht die Meinung der Baden-Württemberg Stiftung oder des Ministeriums für Wissenschaft und Kunst in Baden-Württemberg wider. Schließlich möchten sich die Autoren und die Autorin bei Karen Horn für die auch unter Zeitdruck äußerst sorgfältige Textredaktion und zahlreiche exzellente Kommentare bedanken, die den Beitrag wesentlich verbessert haben.

Abbildung 2.1: Schema der Übergänge Schule–Ausbildung–Beruf



Insbesondere Schüler mit niedrigen Schulabschlüssen haben Probleme, in eine berufliche Ausbildung zu gelangen. Ihre Chancen, sich in einem Bewerberpool durchzusetzen, sind umso schlechter, je mehr Ausbildungssuchende um die Plätze konkurrieren, die auf dem lokalen Arbeitsmarkt vorhanden sind (vgl. Kleinert und Jacob, 2012; Riphahn, 2002; Troltsch und Walden, 2010). Deswegen sind leistungsschwächere Jugendliche eine Zielgruppe vorbeugender Orientierungs- und Fördermaßnahmen in den Schulen und, nach dem Schulabschluss, im Übergangssystem. Dieses umfasst verschiedene kürzere berufliche Bildungsangebote, welche die Ausbildungsreife erhöhen und den Übergang in eine duale oder vollzeitschulische Berufsausbildung erleichtern sollen (vgl. Solga, Baas u. a., 2012).

Auf der anderen Seite gibt es Anzeichen, dass die vorhandenen Stellen im beruflichen Ausbildungssystem zunehmend schwierig zu besetzen sind, insbesondere in anspruchsvollen und damit eigentlich besonders chancenreichen Ausbildungsgängen. Im Jahr 2015 blieben in den Unternehmen 41.000 Ausbildungsstellen unbesetzt (BMBF, 2016). Zu den Besetzungsschwierigkeiten trägt nicht nur bei, dass in Folge des demografischen Wandels die Jahrgangsstärken schrumpfen. Wesentlich sind auch markante Veränderungen im Bildungsverhalten der nachwachsenden Jahrgänge. Die Bereitschaft junger Menschen zu einer Ausbildung sinkt, während die Studienanfängerquoten unter den Schulabgängern zuletzt sprunghaft gestiegen sind (Autorengruppe Bildungsberichterstattung, 2014). Der Trend zur Akademisierung in Deutschland (Stichwort „Bildungsexpansion“) spiegelt sich auch in den wachsenden Anteilen der Jugendlichen, die eine (Fach-)Hochschulreife anstreben (vgl. Fitzenberger, Lickleder und Zimmermann, 2015; Schindler und Reimer, 2010).

In Tabelle 2.1 ist die Verschiebung der Anteile der Neuzugänge in die verschiedenen Sektoren des Berufsbildungssystems zwischen 2000 und 2014 dargestellt. Der Anteil der Studienberechtigten im dualen System ist von 15,8 Prozent auf 21,3 Prozent deutlich gestiegen. Auch im schulischen Berufsbildungssystem hat ihre Beteiligung zugenommen. Absolventen mit mittlerer Reife machen zwar immer noch die Mehrheit der Anfänger in dualen und schulischen Berufsausbildungen aus, ihr Anteil sinkt aber. Hauptschulabsolventen haben 2014 seltener eine duale Berufsausbildung aufgenommen als im Jahr 2000; sie machen einen steigenden Anteil der Neuzugänge im Übergangssystem aus. Während der Anteil 2000 noch 36,1 Prozent betrug, lag er 2014 schon bei 47,7 Prozent.

An die Veränderungen im Bildungsverhalten junger Menschen knüpfen zwei gesellschaftlich bedeutsame Fragenkomplexe an.
Erstens: Verstärkt die Entwicklung die Probleme junger Menschen beim Eintritt in den

Tabelle 2.1: Zusammensetzung der Neuzuggänge in die drei Sektoren der Berufsbildungssystems nach Vorbildung (in Prozent)

	Duales System		Schulberufssystem		Übergangssystem	
	2000	2014	2000	2014	2000	2014
Ohne Hauptschulabschluss	4,6	4,0	0,3	0,3	31,5	23,7
Hauptschulabschluss	29,2	26,5	15,9	17,7	36,1	47,7
Mittlerer Abschluss	50,4	48,3	64,7	59,7	30,8	26,8
(Fach-)Hochschulreife	15,8	21,3	19,2	22,4	1,6	1,8

Anmerkungen: Quelle: BMBF (2016). Daten der Statistischen Ämter des Bundes und der Länder, Integrierte Ausbildungsberichterstattung; Bundesagentur für Arbeit, Bestand von Teilnehmenden in ausgewählten Maßnahmen der Arbeitsmarktpolitik mit SGB-Trägerschaft des Teilnehmenden. Ohne Neuzugänge mit Abschluss unbekannt oder sonstigen Abschlüssen; 2000 enthält zusätzliche Maßnahmen der BA sowie Doppelzählungen zwischen schulischen und außerschulischen Übergangsmaßnahmen.

Arbeitsmarkt, und steigert sie damit die Jugendarbeitslosigkeit? Zwar geht eine akademische Bildung im Allgemeinen langfristig mit besseren Beschäftigungs- und Einkommenschancen einher, wie Pfeiffer und Stichnoth (2015) zeigen. Andererseits kann der Erwerb von berufsspezifischen Kompetenzen, der mit einer dualen Ausbildung verbunden ist, im Vergleich zu weniger spezifischen Formen beruflicher Bildung einen reibungslosen Übergang aus dem Bildungssystem in Beschäftigung fördern, wie Ryan (2001) sowie Hanushek u. a. (2017) nachweisen. Potentielle Einstiegsprobleme können sich noch verstärken, falls die an den Hochschulen erworbenen Qualifikationen am Bedarf der Arbeitgeber vorbeigehen.

Zweitens: Was bedeuten die Veränderungen der Bildungsverläufe im Hinblick auf soziale Benachteiligungen und gesellschaftliche Ungleichheit? Einerseits könnte man die gestiegenen Anteile von Jugendlichen, die eine Hochschulzugangsberechtigung erwerben und ein Studium aufnehmen, als Ausdruck einer mittlerweile gewachsenen Durchlässigkeit des Bildungssystems interpretieren. Andererseits könnte das Ergebnis nach Solga und Wagner (2001) eine zunehmende Polarisierung in dem Sinne bedeuten, dass die soziale Durchmischung in der Gruppe derjenigen abnimmt, die auf den niedrigeren Bildungswegen verbleiben. Von besonderem Interesse sind die Erfahrungen und Reaktionen derjenigen, die erst durch die allgemeine Bildungsexpansion dazu kommen, einen höheren Bildungsweg einzuschlagen, sowie derjenigen, die zwar dem Trend folgend einen höheren Bildungsweg anstreben, an diesem jedoch scheitern.

Die komplexen Prozesse im Übergangsbereich zwischen allgemeinbildenden Schulen, beruflicher Ausbildung und Eintritt in die Berufstätigkeit sind noch relativ selten Gegenstand ökonomischer Analysen, obwohl ihnen eine fundamentale Bedeutung für die im späteren Lebensverlauf erreichbare wirtschaftliche und gesellschaftliche Position zukommt. Ebenso existieren bislang nur wenige belastbare ökonometrische Erkenntnisse darüber, wie das bestehende komplexe Unterstützungssystem die Chancen der Teilnehmer beeinflusst, dass ihnen der anschließende Übergang in eine Ausbildung gelingt und dass sie auch längerfristig ein gutes Entwicklungs- und Karrierepotential auf dem Arbeitsmarkt haben. Diese Themenfelder sind bislang weitgehend eine Domäne soziologischer, psychologischer, erziehungswissenschaftlicher oder wirtschaftspädagogischer Forschung (vgl. Brüggemann und Rahn, 2013; Gaupp u. a., 2008; Lex und Zimmermann, 2011; Solga und Weiß, 2015; Tillmann u. a., 2014). Mit einem Überblick zum Stand der sich dynamisch entwickelnden ökonomischen Berufsbildungsforschung wollen wir in diesem Beitrag veranschaulichen, in welchen Bereichen und auf welche Weise diese hel-

fen kann, Erkenntnislücken zu schließen. Im Vordergrund stehen hierbei Verlaufsstudien auf Basis lokal zu gewinnender Daten sowie auf Ursache-Wirkungs-Beziehung ausgelegte Evaluationsstudien zu Maßnahmen der Berufsorientierung und Qualifizierung in den Übergangsbereichen zwischen Schule, beruflicher Ausbildung und erster Berufstätigkeit.

2.2 Stand der ökonomischen Forschung

2.2.1 Ausbildungsentscheidung der Betriebe

Berufsausbildung ist eine Investition in Humankapital, die sich für die Unternehmen in Folge einer höheren Produktivität im Einsatz der Arbeitskraft rentiert. Die Besonderheit des dualen Ausbildungssystems besteht darin, dass schulisches Lernen und Lernen im Betrieb miteinander verzahnt sind, so dass die Auszubildenden gleichzeitig allgemein verwertbare Qualifikationen und spezifische Erfahrung am Arbeitsplatz sammeln. Beides wirft, dies lehrt die elementare Humankapitaltheorie (Becker, 1964), individuelle Erträge in Form höherer Löhne ab. Es stellt sich jedoch die Frage, warum Arbeitgeber den Erwerb von nicht betriebsspezifischem Humankapital im Rahmen der dualen Ausbildung mitfinanzieren. Schließlich kommen die damit verbundenen Erträge zumindest unter den Bedingungen eines perfekten Arbeitsmarkts nicht dem Unternehmen selbst zugute. Deswegen fokussiert die ökonomische Literatur zur dualen beruflichen Ausbildung – einen Überblick liefern Wolter und Ryan (2011) – die Frage, ob und inwieweit dabei allgemeines oder spezifisches Humankapital entsteht und wer die Kosten der beruflichen Ausbildung übernimmt.

Um die Investitionen der Unternehmen in die Berufsausbildung und die anerkannte Zertifizierung von Ausbildungsabschlüssen, wie sie in Deutschland üblich ist, theoretisch zu begründen, erweitern Acemoglu und Pischke (2000) das Humankapitalmodell von Becker um asymmetrische Informationen. Wenn ausbildende Unternehmen bessere Informationen über die Produktivität ihrer Auszubildenden haben als Unternehmen, die fertig Ausgebildete auf dem Markt rekrutieren, entsteht Monopsonmacht. In Folge dieser Marktunvollkommenheit können Unternehmen die von ihnen qualifizierten Arbeitskräfte über den Ausbildungsabschluss hinaus an sich binden. Darin wiederum steckt ein Anreiz, in die Ausbildung zu investieren. Allerdings vermindern sich zugleich die Anreize der Beschäftigten, selbst in ihre Ausbildung zu investieren. Dem kann eine externe Zertifizierung entgegenwirken, die einen verbindlichen Rahmen für die Anforderungen und Inhalte der betrieblichen Ausbildung schafft.

Wenn Fähigkeiten und Ausbildung komplementär sind, steigt die Produktivität der fähigeren Arbeitskräfte durch die Ausbildung stärker als bei weniger fähigen Arbeitskräften. Acemoglu und Pischke (1998, 1999a,b) zeigen, dass in diesem Fall asymmetrische Informationen und unvollkommene Arbeitsmärkte die Lohnverteilung komprimieren, weil Marktlohn und Produktivität nicht übereinstimmen. Diese sogenannte Lohnkomprimierung, also der geringere Lohnunterschied zwischen gelernten und ungelernten Arbeitskräften, ermutigt wiederum die Unternehmen, auch in allgemeines und nicht nur in betriebsspezifisches Humankapital zu investieren. Zu einer Lohnkomprimierung, welche die Beteiligung der Unternehmen an der Finanzierung der Ausbildung erhöht, können auch Arbeitsmarktinstitutionen beitragen, beispielsweise das Tarifvertragssystem, wie Dustmann und Schönberg (2009) zeigen.

Ein anderer Erklärungsansatz jenseits der Lohnkomprimierung zielt auf die tatsächliche Spezifizierung der Qualifikation. Zwar sind die einzelnen Fähigkeiten jeweils dem

allgemeinen Humankapital zuzuordnen, in ihrer Gewichtung jedoch sind sie betriebsspezifisch. Unternehmen, die in Ausbildungsberufen ausbilden, die relativ betriebsspezifisch sind, erwächst dadurch ein Anreiz zu solchen Investitionen (vgl. Geel u. a., 2011; Lazear, 2009). Es stellt sich als relativ schwierig heraus, betriebsspezifische Qualifikationen empirisch eindeutig von allgemeinen Qualifikationen zu trennen. In empirischen Analysen zum Vergleich der Löhne übernommener und nicht übernommener Auszubildender finden sich negative Effekte eines Firmenwechsels. Dies spricht für einen hohen Anteil betriebsspezifischen Humankapitals (Fitzenberger, Lickleder und Zwiener, 2015), auch wenn dies der Selbsteinschätzung von Beschäftigten widerspricht (Dustmann und Schönberg, 2012).

Die beschriebenen Mechanismen fallen in die Kategorie der investitionsorientierten Motivation von Unternehmen, Beschäftigte auszubilden, wie sie Lindley (1975) beschrieben hat. Dem steht die produktionsorientierte Ausbildungsmotivation gegenüber. Hier gilt als entscheidend, dass Auszubildende in der Produktion relativ günstige Arbeitskräfte sind. Wenn man sie mit Löhnen unterhalb ihrer marginalen Produktivität bezahlen kann und wenn die Regulierung der Inhalte und Qualität der Ausbildung nicht sehr stark sind, können sich für die Unternehmen auch schon während der Ausbildungszeit Nettogewinne ergeben (vgl. Mohrenweiser und Backes-Gellner, 2010; Mohrenweiser und Zwick, 2009; Mühlemann u. a., 2010). Dionisius u. a. (2009) zeigen, dass sich die Ausbildungsmärkte in Deutschland und in der Schweiz in dieser Hinsicht unterscheiden: Während deutsche Betriebe erheblich in die Ausbildung investieren und mithin Nettokosten tragen, haben Schweizer Betriebe negative Nettokosten, erzielen also Nettogewinne. Dies geht mit deutlich höheren Ausbildungsentgelten in Deutschland einher (Ryan u. a., 2011). Dass deutsche Betriebe dennoch ausbilden, könnte nach Mohrenweiser und Zwick (2009) sowie Wolter und Ryan (2011) damit zu erklären sein, dass die Hälfte der Auszubildenden nach Abschluss mindestens ein Jahr in ihren Ausbildungsbetrieben verbleibt und diese ihre Investitionen dann durch Bezahlung unterhalb der Produktivität kompensieren.

Insgesamt gesehen zeigt die ökonomische Berufsausbildungsforschung, dass vor allem Arbeitsmarktfriktionen die Ursache dafür sind, dass Unternehmen ausbilden und zumindest Teile der Kosten einer beruflichen Ausbildung tragen. Einige Unternehmen nutzen Auszubildende als Ersatz für ungelernte und gelernte Beschäftigte und profitieren so schon während der Ausbildungszeit von ihnen. Es ist nicht vollständig geklärt, weshalb sich einzelne Unternehmen unter gleichen institutionellen Bedingungen dafür oder dagegen entscheiden auszubilden. Dennoch sind die Motive der Betriebsleitungen, junge Leute auszubilden, in der ökonomischen Literatur wesentlich besser abgehandelt als die Entscheidungsprozesse der Jugendlichen in der Frage, ob sie sich überhaupt ausbilden lassen.

2.2.2 Ausbildungsentscheidung von Jugendlichen

Über welche Bildungswege Jugendliche entscheiden können, hängt unter anderem von ihren schulischen Leistungen und erreichten Bildungsabschlüssen ab. Deshalb analysieren Wissenschaftler die Entscheidung über Investitionen in Bildung häufig auf Grundlage einer „Bildungsproduktionsfunktion“ (vgl. Hanushek, 1979; Todd und Wolpin, 2003). Diese Literatur zeigt auch weitere wichtige Determinanten von Bildungs- und Berufsentscheidungen auf. So ist der familiäre Hintergrund, der Einkommen, Bildungsgrad und Beruf der Eltern einschließt, einer der wichtigsten Determinanten von Bildung (vgl. Biewen und Tapalaga, 2017; Dustmann, 2004; Heineck und Riphahn, 2009; Holmlund u. a., 2011) und Berufswahl (vgl. Blanden u. a., 2014; Hellerstein und Morrill, 2011).

Ob die soziale Selektion in verschiedene Schultypen und damit zu unterschiedlichen Bildungsabschlüssen langfristig problematisch ist, stellen Dustmann, Puhani u. a. (2017) in Frage. Sie zeigen, dass die Durchlässigkeit des deutschen Schulsystems Korrekturen am Bildungsweg erlaubt. Weitere Bestimmungsfaktoren für den Bildungserfolg können die Charakteristika und Ressourcen der Schulen sein, wobei die Wirkung im Detail noch umstritten sind (vgl. Koch u. a., 2015). Zunehmend steigt das Interesse an der Bedeutung von nicht-kognitiven Fähigkeiten und von Persönlichkeit für den Bildungserfolg und die Berufswahl (vgl. Almlund u. a., 2011; John und Thomsen, 2014; Kohlrausch und Solga, 2012; Kunz und Staub, 2016; Neuenschwander, 2012; Protsch und Dieckhoff, 2011).

In der ökonomischen Berufsbildungsforschung gewinnt mit dem verstärkten Interesse an verhaltensökonomischen Erklärungen von Bildungsentscheidungen (vgl. Koch u. a., 2015; Lavecchia u. a., 2016) auch das berufliche Entscheidungsverhalten von Jugendlichen mehr Aufmerksamkeit. Dabei hinterfragen die Wissenschaftler, ob es angemessen ist, diese Bildungsentscheidung als rationale Investitionsentscheidung zu modellieren. Zentral ist die Frage, ob die bisherige Literatur, in der Bildung als klassisches Investitionsgut gilt, der Entscheidungsstruktur von Jugendlichen empirisch gerecht wird. So weisen Lavecchia u. a. (2016) ausgehend von Kahneman (2003) darauf hin, dass eine hohe Gegenwartspräferenz („Zeitpräferenz“) von Jugendlichen mit sich bringt, dass sie die potenziellen künftigen Erträge von Ausbildungsinvestitionen systematisch geringer veranschlagen. Junge Menschen bewerten Gewinne in der Gegenwart stärker als Gewinne in der Zukunft und verspüren mithin einen geringeren Anreiz, zu diesem Zeitpunkt in Bildung zu investieren. Golsteyn u. a. (2014) zeigen, dass sich die Zeitpräferenz auf spätere Arbeitsmarktergebnisse auswirkt. Wer Zukunftserträge stärker diskontiert, wird häufiger arbeitslos als andere.

Ein Projektionsfehler („Projection bias“) kann diese als „Present bias“ bezeichnete Verzerrung weiter verstärken. Er tritt auf, wenn sich Menschen nicht in ihre künftige Lage und die damit verbundenen Interessen und Präferenzen hineinversetzen können. Sie entscheiden deshalb auf Grundlage ihrer gegenwärtigen Präferenzen mit Blick auf künftige Belange (vgl. DellaVigna, 2009; Lavecchia u. a., 2016). Im Zusammenhang mit der Berufs- und Bildungsentscheidung wird der Projektionsfehler insbesondere dann relevant, wenn sich schulisch schwächere Jugendliche auf ihre Misserfolge konzentrieren und sich in Folge dessen durchaus denkbare Bildungswege als unmöglich vorstellen – oder wenn sie nur deshalb nicht die Schule wechseln, weil sie fürchten, ihren Freundeskreis zu verlieren. Lavecchia u. a. (2016) führen außerdem an, dass Jugendliche Bekanntes dem Unbekannten vorziehen. Dies könnte erklären, weshalb manche vorziehen, weiterhin zur Schule zu gehen, statt eine Ausbildung zu beginnen, auch wenn dies nicht der für sie optimale Weg ist.

Schließlich ist die Bildungsentscheidung unter unvollkommener Information zu treffen. Diese bezieht sich sowohl auf die eigenen Fähigkeiten als auch auf die unterschiedlichen Optionen. Dies ist problematisch, wenn die Jugendlichen die schon vorhandenen Informationen überbewerten, weil sie sich selbst überschätzen („Overconfidence bias“). Ihnen entgeht so der Wert zusätzlicher Informationen, was sich insbesondere dann bemerkbar macht, wenn sie vielen Optionen gegenüber stehen. Während die Vertreter der neoklassischen Theorie davon ausgehen, dass mehr Auswahl zu besseren Ergebnissen führt, ist es schließlich auch möglich, dass die Individuen die jeweils bekannteste oder einfachste Option wählen oder dass sie die Entscheidung aufschieben, schlicht weil ihre kognitiven Kapazitäten und ihre Aufmerksamkeit begrenzt sind.

Da Bildungsentscheidungen Entscheidungen unter Unsicherheit sind, ist bei der Betrachtung des Entscheidungsprozesses zur Berufs- und Bildungswahl auch die Risikoaversion

zu beachten (Hartog und Diaz-Serrano, 2015). Empirische Untersuchungen unterstützen die Vermutung, dass Risikoaversion Bildungsentscheidungen relativ schwach beeinflusst (Belzil und Leonardi, 2007), die Berufswahl dagegen stärker (Bonin, Dohmen u. a., 2007). Fouarge u. a. (2014) bestätigen die Ergebnisse von Bonin, Dohmen u. a. (2007) und ergänzen sie um die Bedeutung der Zeitpräferenz, die in Kombination mit Risikoaversion die Berufswahl von Berufseinsteigern beeinflusst.

Zahlreiche Unterstützungsmaßnahmen zielen darauf, Jugendlichen Information und Orientierung zu vermitteln, um ihre Unsicherheit bei der Berufs- und Bildungswahl zu verringern. Aus ökonomischer Sicht bestünde eine Aufgabe darin, den Jugendlichen zu einer realistischen Einschätzung der eigenen Fähigkeiten und des zu erreichenden Lohns zu verhelfen. In der bisherigen Literatur beschäftigt man sich in diesem Zusammenhang aber überwiegend mit der Studienfachwahl und mit der Anpassung der Erwartungen bezüglich der eigenen Fähigkeiten und der zu erreichenden Ziele. Zafar (2011), Stinebrickner und Stinebrickner (2012, 2014) sowie Wiswall und Zafar (2015) zeigen, dass Erwartungen bezüglich der eigenen Fähigkeiten wichtig für die Wahl des Studienfachs sind und dass die jungen Leute ihre Erwartungen anpassen, wenn sie im Studienverlauf neue Informationen erlangen. Wenig behandelt sind die Erwartungen von Jüngeren und im Kontext des deutschen Ausbildungssystems. Attanasio und Kaufmann (2014) zeigen, dass in Mexiko die Lohnerwartungen relevant sind, wenn Jugendliche und ihre Eltern die grundsätzliche Entscheidung treffen, in Bildung zu investieren. Jensen (2010) beobachtet, dass in der Dominikanischen Republik mehr Informationen über Bildungsrenditen die Bereitschaft fördern, in Bildung zu investieren. Kunz und Staub (2016) belegen, dass es für die Bildungsentscheidung und für den Bildungserfolg nach der Sekundarstufe I bedeutsam ist, ob man selber erwartet, einen bestimmten Bildungsabschnitt erfolgreich abschließen zu können. Schätzungen getrennt nach erreichtem Bildungsabschluss (hier: duale Ausbildung ohne Abitur, duale Ausbildung mit Abitur und Hochschulabschluss) zeigen, dass die subjektiven Erwartungen für Schülerinnen und Schüler, die eine duale Ausbildung ohne Abitur anstreben, am wichtigsten sind, wenn der Einfluss von Noten und anderen Charakteristika in der Schätzung berücksichtigt ist.

Zwar ist wenig bekannt über die Entscheidungsprozesse von Jugendlichen, die eine Berufsausbildung anstreben. Doch es gibt einige Untersuchungen über die Wirkung von Berufsorientierungsmaßnahmen, die sie bei ihrer Erwartungsbildung und Entscheidung unterstützen sollen. Saniter u. a. (2019) zeigen, dass der Zugang zu Informationen über verschiedene Berufe durch die Ausbreitung der Berufsinformationszentren (BIZ) der Bundesagentur für Arbeit zur erfolgreichen Integration in den Arbeitsmarkt beitragen kann. Diese Studie ist die einzige uns bekannte Studie zur mittel- und langfristigen Wirkung von Berufsorientierungsmaßnahmen während der Schulzeit in Deutschland. Die Evaluation von Projekten in Niedersachsen zur Unterstützung des Übergangs von Hauptschülerinnen und Hauptschülern in Ausbildung hat gezeigt, dass Praxisklassen und Berufsstartbegleitung deren Aussichten verbessern, einen Hauptschulabschluss zu erreichen und danach eine Ausbildung zu beginnen (Solga, Baas u. a., 2011). Zudem finden Solga und Kohlrausch (2013) Evidenz dafür, dass Praktika die Wahrscheinlichkeit, einen Ausbildungsplatz zu bekommen, bedeutend erhöhen.

In der internationalen Forschung gibt es einige Studien zur kurzfristigen und zum Teil auch zur langfristigen Wirkung von Beratungsangeboten. Angesichts der Unsicherheit der Jugendlichen über die eigenen Fähigkeiten und Präferenzen ist es vermutlich notwendig, die Informationen mit einer Beratung zu verbinden. Hoest u. a. (2013) haben eine Reform der Berufsorientierung in Dänemark evaluiert, in Folge derer diese Art von Beratung im ganzen Land zur Verfügung steht. Die Ergebnisse der Studie zeigen, dass

die Reform die schulische Leistung von Schülerinnen und Schüler mit Migrationshintergrund verbessert hat. Auch Borghans u. a. (2015) und Neumark und Rothstein (2007) haben nachgewiesen, dass ein individuelles Coaching von Jugendlichen mit geringen Bildungschancen in den Niederlanden die Studienfachwahl und in den Vereinigten Staaten den Übergang zur postsekundären Bildung bzw. zur Beschäftigung verbessert hat. Goux u. a. (2015) zeigen mittels eines Feldexperiments in Frankreich, dass eine individuelle Beratung hilft, sich realistische Ziele zu setzen und diese auch zu erreichen. Rodríguez-Planas (2012) untersucht die kurz- und längerfristige Wirkung eines Programms in den Vereinigten Staaten, das Mentoring[1] und andere Unterstützungsangebote mit finanziellen Anreizen verknüpft. Kurzfristig wirkt sich dieses auf den Schulabschluss und den Beginn der weiterführenden Bildung insbesondere von Mädchen aus, während die Arbeitsmarkteffekte in der längeren Frist vernachlässigbar sind.

Aus der internationalen Forschung gibt es empirische Ergebnisse zur kurz- und mittelfristigen Wirkung von Maßnahmen der Berufsorientierung auf verschiedene Zielvariablen wie den Stand der Berufsorientierung und den Übergang in weiterführende Bildung. Vereinzelt liefern Evaluationen deutscher Berufsorientierungsprojekte Erkenntnisse über deren kurzfristige Wirkung. Die mittelfristige Wirkung von Praktika, Beratungsangeboten und Zusatzunterricht auf die Stabilität des Ausbildungsverhältnisses und den Ausbildungserfolg ist dahingegen weit weniger erforscht. Für die langfristige Wirkung gibt es nach unserem Kenntnisstand insbesondere für Deutschland wenige empirische Ergebnisse; die bestehenden internationalen Studien deuten darauf hin, dass die Wirkung langfristig nachlässt. Für Deutschland ist die positive Wirkung der Berufsinformationszentren (BIZ) nachgewiesen (Saniter u. a., 2019); allerdings stellen diese heute nur eine von vielen Informationsquellen für die Jugendlichen dar.

Zum Abschluss dieses Abschnitts sei darauf hingewiesen, dass die internationale ökonomische Literatur für ein Verständnis der Entscheidungsprozesse von Abgängern aus dem unteren Zweig des deutschen gegliederten Schulsystems (Hauptschulen oder vergleichbare Schulformen) nur wenig aufschlussreich ist. Diese beenden ihre allgemeinbildende Bildung im internationalen Vergleich in einem sehr niedrigen Alter. In diesem Schulzweig gibt es viele Maßnahmen zur Berufsorientierung; nur 26 Prozent der Schülerinnen und Schüler dieses Schultyps gelingt der Übergang in eine berufliche Ausbildung direkt nach dem Hauptschulabschluss (Gaupp u. a., 2008). Zudem gehen Jugendliche mit Migrationshintergrund und Mädchen ohne Migrationshintergrund mit größerer Wahrscheinlichkeit in das Übergangsystem über als andere (Beicht, 2009; Fitzenberger und Lickleder, 2015). Im Jahr 2014 begannen rund 253.000 junge Menschen Bildungsgänge des Übergangssystems (Statistisches Bundesamt, 2015). Diese Jugendlichen brauchen nach einer Studie von Enggruber und Ulrich (2014) deutlich länger für den Übergang in den Beruf; 80 Prozent dieser Jugendlichen gelingt der Übergang in die erste Berufsausbildung innerhalb von fünf Jahren nach dem Schulabschluss.

In einer Studie zu Baden-Württemberg weisen Jahn u. a. (2014) einen negativen Zusammenhang zwischen der Teilnahme an berufsvorbereitenden Maßnahmen und der erfolgreichen Arbeitsmarktintegration nach beruflicher Ausbildung nach. Zur Beurteilung der kausalen Wirkung der Maßnahmen fehlt jedoch ein Vergleich zu der kontrafaktischen Situation ohne Teilnahme an den Maßnahmen. Zudem geht es nur um Maßnahmen, die zu keinem höheren Schulabschluss führen. Kübler u. a. (2019) führen eine Audit-

[1] Mentoring durch Ehrenamtliche, insbesondere für benachteiligte Jugendliche, soll deren soziale Fähigkeiten wie auch schulische Leistungen und Berufsorientierung verbessern. Rodríguez-Planas (2014) beschreibt den auch ökonomischen Forschungsbedarf zu den mittel- und langfristigen Wirkungen von Mentoring.

Studie für eine deutsche Großstadt durch, im Rahmen derer randomisiert fiktive Bewerbungen auf Ausbildungsplätze verschickt wurden. Es zeigt sich, dass die Teilnahme an berufsvorbereitenden Maßnahmen im Vergleich zu einer Lücke im Lebenslauf die Chance erhöht, zu einem Vorstellungsgespräch eingeladen zu werden. Von Vorteil für den Übergang können Bildungsgänge im Übergangsystem sein, die es erlauben, zügig einen höheren Schulabschluss zu erreichen Beicht (2009), Enggruber und Ulrich (2014), Solga (2004) und Solga und Weiß (2015). Nach unserem Kenntnisstand liegen aber keine Erkenntnisse darüber vor, ob hier der Schulabschluss oder der jeweilige Bildungsgang an sich der treibende Mechanismus ist. Auch erscheint uns nicht eindeutig geklärt, ob die entsprechenden Schulabschlüsse dieselbe Wirkung auf den Übergang in Ausbildung entfalten, unabhängig vom Weg, über den sie erlangt wurden. Solga (2015) merkt dabei an, dass die Ergebnisse zur Wirkung von Übergangsmaßnahmen nur Zusammenhänge zeigen, nicht aber Kausalitäten, da die Literatur bisher nicht ausschließen kann, dass dieselben Faktoren die Selektion in das Übergangssystem und den Übergang in eine berufliche Ausbildung beeinflussen und somit die Wirkung des Übergangssystems verzerrt geschätzt wird. Insbesondere bleibt die Wirkung kognitiver und nicht-kognitiver Kompetenzen sowie regionaler Ausbildungsmarktbedingungen außen vor.

Die Probleme von Hauptschülerinnen und Hauptschülern beim Übergang zwischen Schule und Beruf liegen nicht allein an einem schwierigen Ersteinstieg in eine berufliche Ausbildung. Diese Jugendlichen (mit bzw. sogar ohne Hauptschulabschluss) sind mit einer Vertragslösungsquote von 35 bis 39 Prozent auch deutlich überdurchschnittlich oft von einem vorzeitigen Abbruch der betrieblichen Ausbildung betroffen (Rohrbach-Schmidt und Uhly, 2015). Die Determinanten für eine Vertragslösung sind vielfältig; sie liegen sowohl im betrieblichen und beruflichen Bereich als auch bei den individuellen Eigenschaften der Auszubildenden (vgl. Beicht und Walden, 2013; Bessey und Backes-Gellner, 2008; Rohrbach-Schmidt und Uhly, 2015). In dem hier betrachteten Zusammenhang ist interessant, dass schlechte regionale Arbeitsmarktbedingungen die Wahrscheinlichkeit eines Abbruchs erhöhen. Das lässt sich wohl durch die geringere Passgenauigkeit des Ausbildungsplatzes erklären, wie Bessey und Backes-Gellner (2008) vermuten. Auch gaben Auszubildende, die ihre Ausbildung abbrachen, relativ häufig an, der Beruf habe ihnen nicht zugesagt (Beicht und Walden, 2013). Der regionale Ausbildungsmarkt und die Berufswahl spielen somit nicht nur für den Übergang in eine Ausbildung, sondern auch für deren Erfolg und Stabilität eine wichtige Rolle.

2.2.3 Renditen der dualen Ausbildung

Die Renditen einer dualen Ausbildung sind für die Entscheidungen sowohl der Betriebe als auch der Jugendlichen eine zentrale Größe. Zwar besteht in der Literatur Einigkeit über die positiven Renditen von zusätzlicher Bildung, doch der Vergleich von Bildungsrenditen der einzelnen Komponenten verschiedener Bildungswege ist schwierig. So setzt in Deutschland ein Hochschulstudium im Vergleich zu einer Berufsausbildung schon einen längeren Bildungsweg in der Sekundarstufe voraus. Die geschätzten Bildungsrenditen unterliegen Selektionsprozessen, die zum Teil auf unbeobachtete Fähigkeiten zurückgehen, zum Teil aber auch auf Präferenzen bezüglich der Ausbildungsart (zum Beispiel theoretisch vs. praktisch) oder auf Risikoaversion (Eichhorst u. a., 2015). Entsprechend schränken manche Autoren die Analyse auf möglichst homogene Gruppen ein (Glocker und Storck, 2014; Riphahn und Zibrowius, 2016), beispielsweise auf Schülerinnen und Schüler der Haupt- und Realschulen, die über den Beginn einer Ausbildung entscheiden, ohne direkt über die Option eines Studiums zu verfügen. Für diese Gruppe

besteht ein deutlicher positiver Zusammenhang zwischen der Berufsausbildung, dem Arbeitsmarkteinstieg nach Berufsausbildung und dem zu erwartenden Lohn. Riphahn und Zibrowius (2016) schätzen nun, dass eine berufliche Ausbildung mit einem um 11 Prozent höheren Lohn einhergeht. Sie sehen dies als untere Grenze der wahren Rendite einer beruflichen Ausbildung im Vergleich zum ungelernten Arbeiten im Alter von 25 Jahren. Da sie diesen Effekt im Vergleich mit Haupt- und Realschulabsolventen messen, die weder eine Berufsausbildung noch das Abitur abgeschlossen haben, könnte die geschätzte Ausbildungsrendite jedoch überhöht sein. Freilich ist der genannte Wert vergleichbar mit den Ergebnissen für Österreich von Fersterer und Winter-Ebmer (2003). Sie vermeiden mögliche Selektionsverzerrungen bei der Schätzung der Renditen beruflicher Ausbildung, indem sie Lohnunterschiede zwischen den Auszubildenden auswerten, die durch zufällige Insolvenzen von Ausbildungsbetrieben entstehen. Malamud und Pop-Eleches (2010) sowie Hall (2012) verwenden institutionelle Veränderungen, um das Selektionsproblem in den Griff zu bekommen. Sie finden keine systematischen Renditeunterschiede zwischen allgemeinbildender und beruflicher Bildung auf der höheren Sekundarstufe.

In einer internationalen Vergleichsstudie entdecken Hanushek u. a. (2017) einen möglichen Zielkonflikt in der Abwägung zwischen einer spezifischen und einer allgemeinen Berufsausbildung. Eine berufliche Ausbildung erhöht zwar die Beschäftigungswahrscheinlichkeit in geringem Alter; dieser Vorteil verschwindet aber über den Lebenszyklus. Beschäftigte mit allgemeinerer Berufsausbildung erfahren im Zeitverlauf mehr Weiterbildung. Dabei haben dies in Anbetracht des technologischen Wandels vielmehr Menschen mit spezifischen Berufsausbildungen nötig, um ihre Beschäftigung zu sichern. Da die empirischen Ergebnisse von Hanushek u. a. (2017) auf Querschnittsdaten beruhen, lassen sich hier allerdings Alterseffekte nicht von Kohorteneffekten trennen. Es wäre sinnvoll, die Analyse mit den kompletten Lebensverlaufsdaten für feste Kohorten zu replizieren.

Adda u. a. (2013) verwenden Lebensverlaufsdaten in einem strukturellen Lebenszyklusmodell, um den Berufsweg von Fachkräften mit Berufsausbildung mit ungelernten Arbeitskräften im selben Berufsfeld zu vergleichen. Sie zeigen, dass gelernte Arbeitskräfte mit deutlich höheren Löhnen in den deutschen Arbeitsmarkt einsteigen, dass ungelernte Arbeitskräfte jedoch in den ersten fünf Jahren ein starkes Lohnwachstum erfahren. Diese Lohnsteigerung ist überwiegend auf eine Produktivitätssteigerung durch „Learning on the job“ und nicht auf einen Jobwechsel zurückzuführen. Dennoch sind ungelernte Arbeitskräfte mobiler, was sowohl mit einer größeren Wahrscheinlichkeit verbunden ist, den Arbeitsplatz zu verlieren („Job destruction rate“), als auch einer größeren Wahrscheinlichkeit, ein neues Stellenangebot zu erhalten („Job arrival rate“). Diese Mobilität führt zu geringeren Renditen der beruflichen Ausbildung, als man zunächst erwarten könnte. Adda u. a. (2013) schätzen die Rendite des Erwerbs einer betrieblichen Ausbildung auf 11,6 Prozent. Dieser Wert ist mit den Ergebnissen von Fersterer, Pischke u. a. (2008) sowie Riphahn und Zibrowius (2016) vergleichbar. Gegenüber einer ungelernten Berufstätigkeit liegt die Zusatzrendite einer beruflichen Ausbildung wohl bei 2,5 bis 4 Prozent pro Jahr der Ausbildung.

Für den direkten Vergleich der Renditen von dualer Berufsausbildung und Hochschulabschluss gibt es noch kaum belastbare Evidenz. Zwar scheinen die geschätzten Renditen mit allgemeinen Bildungsrenditen vergleichbar (Eichhorst u. a., 2015). Allerdings beobachten Fitzenberger, Osikominu u. a. (2016) höhere Verdienste der Personen mit Hochschulabschlüssen, gemessen am Jahreseinkommen im Alter von 30 Jahren. Die Verdienstunterschiede zwischen den beiden Gruppen sind zudem in den Geburtsjahrgängen 1967–76 im Vergleich zu den Geburtsjahrgängen 1957–66 gestiegen. Was den Vergleich der Renditen verschiedener Bildungswege angeht, der über möglichst lange Zeiten des

Lebensverlaufs erfolgen sollte, gibt es aber noch erhebliche Erkenntnislücken. Diese zu schließen, wäre wichtig, um empirisch klarere Aussagen über die relative Attraktivität der dualen Ausbildung treffen zu können.

2.3 Berufsorientierung an Hauptschulen in der Region Freiburg

Die weiterhin bestehenden Schwierigkeiten des Übergangs von der Schule in den Beruf treffen insbesondere Absolventen der Hauptschule, einer Schulform, deren Bedeutung sehr stark zurückgegangen ist.[2] Je mehr Schüler höhere Bildungsabschlüsse erwerben, desto geringer ist die soziale Durchmischung und umso schlechter wird das Lernklima an den Hauptschulen, wie Solga und Wagner (2001) feststellen: In den 2000er Jahren weisen Hauptschüler mehr sozial nachteilige Prägungen als Schüler der Realschulen und Gymnasien auf. So liegen häufiger schwierige Familienverhältnisse oder ein Migrationshintergrund vor. Die Anbindung an den Arbeitsmarkt ist schwächer und die Eltern gehen häufig einfachen Tätigkeiten nach oder sind gar nicht erwerbstätig. Hauptschüler landen besonders häufig im Übergangssystem. Während 34 Prozent der Absolventen aller Schularten 2008 in berufsvorbereitende Maßnahmen einmünden, liegt der entsprechende Anteil der Absolventen der Hauptschulen bei 50,2 Prozent (Autorengruppe Bildungsberichterstattung, 2010). Unter ihnen waren Schüler mit Migrationshintergrund besonders betroffen: 66,4 Prozent der Hauptschulabsolventen mit Migrationshintergrund münden ins Übergangssystem (BMBF, 2008).

Es liegt deshalb im öffentlichen Interesse, an den Hauptschulen wirksame Instrumente zu etablieren, die den reibungslosen Übergang in eine Berufsausbildung erleichtern. Für gute Arbeitsmarktchancen müssen dabei neben den kognitiven auch nicht-kognitive Fähigkeiten entwickelt werden (Cunha und Heckman, 2007). Entsprechend stellen Maßnahmen in der Hauptschule zur Verbesserung der Übergangschancen auch auf die Berufsorientierung und Ausbildungsfähigkeit ab (vgl. Solga, Baas u. a., 2012). In diesem Abschnitt stellen wir exemplarisch Ergebnisse von Untersuchungen durch Fitzenberger und Lickleder (2015, 2016) zu den Wirkungen spezifischer Fördermaßnahmen für Hauptschüler in der Region Freiburg zusammen und ergänzen sie um weitergehende Informationen.

Angesichts einer geringen Quote direkter Übergänge in eine betriebliche Ausbildung dient das Förderprojekt „Erfolgreich in Ausbildung“ (EiA) in Freiburg seit dem Schuljahr 2007/08 der „Einrichtung vertiefter berufsorientierter Maßnahmen“ an allen damaligen Freiburger Hauptschulen. Im Rahmen einer zweijährigen Förderung sollen externe Lehrkräfte in der 8. und 9. Klasse zusätzlich zum regulären Unterricht den Schülern beibringen, wie sie den für sie richtigen Beruf finden und die dafür notwendigen Qualifizierungswege planen und beschreiten können. Die Datengrundlage der beiden Studien besteht aus selbst erhobenen Umfragedaten, administrativen Schuldaten sowie Informationen über sozialversicherungspflichtige Beschäftigung aus den Daten der Bundesagentur für Arbeit.[3] Die Daten wurden von 2008 bis 2010 für zwei Jahrgänge der Klassen 8 und 9 an Hauptschulen im Raum Freiburg erhoben, durch eine Befragung von Schülern,

[2] Beispielsweise haben während der vergangenen Dekade in Baden-Württemberg die optional bis zur zehnten Klasse führenden Werkrealschulen (WRS) die Hauptschulen ersetzt. Vgl. Kultusministerium Baden-Württemberg, „Die Werkrealschule in Baden-Württemberg – Kurzbeschreibung“, http://www.kultusministerium.baden-wuerttemberg.de/extsites/Hauptschule-BW/leistung/werkrealschule.htm (abgerufen am 31. Dezember 2008).

[3] Die Befragungsdaten wurden mit den Ausbildungs- und Beschäftigungsinformationen über das Forschungsdatenzentrum der Bundesagentur für Arbeit und des IAB in Nürnberg in den Fällen verknüpft, in denen die Zustimmung der Schülerinnen und Schüler bzw. deren Eltern vorliegt.

Lehrkräften und Eltern. Ein Schwerpunkt der Befragungen lag auf den Maßnahmen der Berufsorientierung. Erfasst wurden die Anzahl und die Dauer der absolvierten Praktika sowie die subjektive Einschätzung von Schülern und Lehrern zum individuellen Fortschritt in der Berufsplanung. Weiterhin liegen administrative Daten über die Notenentwicklung in den Fächern Deutsch und Mathematik, die Teilnahme am Zusatzunterricht als Vorbereitung für weiterführende Schulen und den Übergang nach Abschluss der Klasse 9 vor.[4]

In ihrer ersten Studie beschränken sich Fitzenberger und Lickleder (2015) auf die Analyse der Daten für die Stadt Freiburg (EiA-Daten) und untersuchen den Zusammenhang zwischen der Berufsorientierung, der Notenentwicklung und den direkten Übergängen nach Abschluss der Hauptschule. In der zweiten Studie betrachten Fitzenberger und Lickleder (2016) dann die zusätzlichen Maßnahmen der Berufsorientierung durch das EiA-Projekt in Freiburg als quasi-experimentelles „Treatment“ und schätzen den kausalen Treatmenteffekt auf das Erreichen der mittleren Reife als zweiten Bildungsabschluss. Sie verwenden vergleichbare Hauptschulen aus dem Freiburger Umland als Kontrollgruppe, also als Bezugsgröße, um den Effekt zu isolieren.

2.3.1 Ergebnisse für die Treatmentgruppe Stadt Freiburg

Fitzenberger und Lickleder (2015) betrachten den Zusammenhang zwischen den schulischen Leistungen, der Berufsorientierung sowie dem Übergang nach Abschluss der Klasse 9. Über beide Jahrgänge hinweg haben sie in Freiburg 433 Schüler befragt. 48 Prozent sind Mädchen, 40 Prozent haben Migrationshintergrund. Am Zusatzunterricht nehmen 53 Prozent der Schüler teil, wobei hier die Schüler mit Migrationshintergrund leicht unterrepräsentiert sind, siehe Abbildung 2.2.

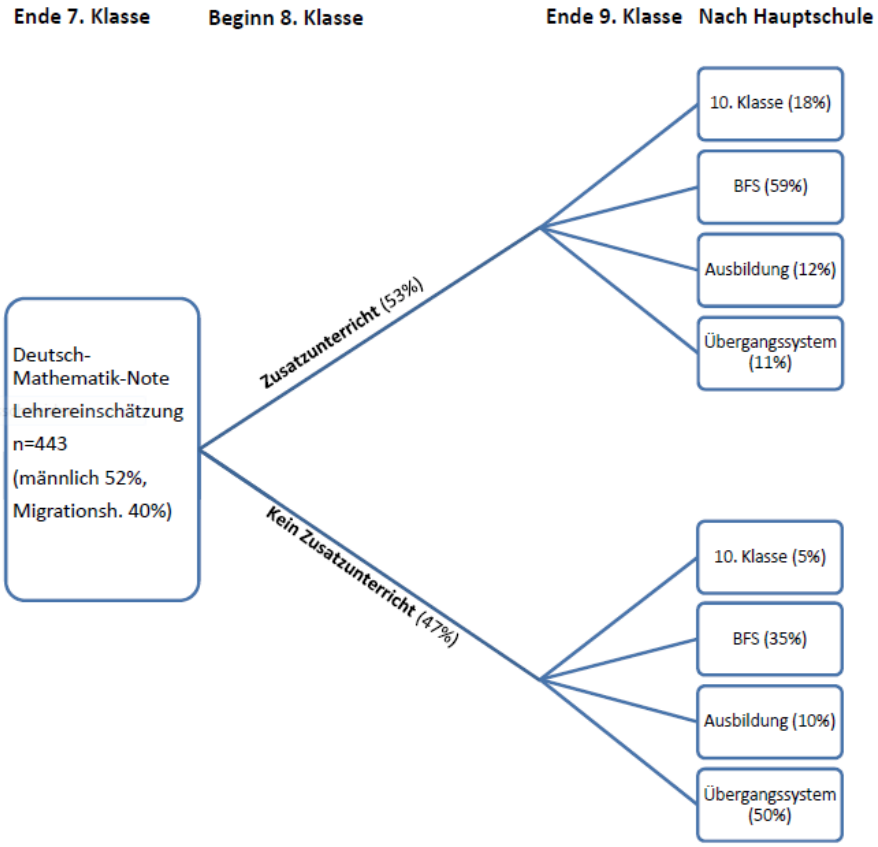
Im Hinblick auf die Notenentwicklung vom Jahreszeugnis in Klasse 7 bis zum Jahreszeugnis in Klasse 9 in den Fächern Deutsch und Mathematik verbessern sich Jungen im Allgemeinen und insbesondere Jungen ohne Zusatzunterricht. Die Notenverbesserung ist am stärksten für Jungen mit Migrationshintergrund (meist ohne Zusatzunterricht). Mädchen verschlechtern sich; insbesondere jene mit Migrationshintergrund.

Nach Abschluss der Hauptschule eröffnen sich verschiedene Möglichkeiten. Zu diesen zählen der direkte Übergang in eine Ausbildung, in Klasse 10, in eine Berufsfachschule (BFS) für ein bis zwei Jahre oder in berufsvorbereitende Bildungsmaßnahmen (Übergangssystem). Etwa 18 Prozent der Jugendlichen streben direkt eine Ausbildung an. Besonders hoch ist der Anteil der Schüler, die zunächst eine weiterführende Schule besuchen möchten. Letzteres hängt eng damit zusammen, dass wie erwähnt 53 Prozent der Schüler am Zusatzunterricht teilnehmen, der dem Ziel dient, einen höheren Schulabschluss zu erwerben.

Tabelle 2.2 (Spalte a) dokumentiert den tatsächlichen Übergang nach Abschluss der Hauptschule. Nur etwa 10,6 Prozent der Schüler gelingt der direkte Übergang in eine Ausbildung. Auch der Übergang in Klasse 10 der Werkrealschule fällt mit etwa 12 Prozent im Vergleich mit der Teilnahmequote am Zusatzunterricht niedrig aus. Besonders häufig findet ein Übergang in die Berufsfachschule statt. Darüber hinaus mündet jeder vierte Schüler in das Übergangssystem ein. Unterscheidet man nach der Teilnahme am

[4] In den Jahren der Befragung ist die Teilnahme am Zusatzunterricht in den Klassenstufen 8 und 9 Mitvoraussetzung für den direkten Übergang in Klasse 10, der eine mittlere Reife ermöglicht. Die Entscheidung fällt auf Basis des Jahreszeugnisses in Klasse 7 und ist zudem abhängig von der Einschätzung des Lehrers.

Abbildung 2.2: Übergänge in der Freiburger Stichprobe



Anmerkung: BFS = Berufsfachschule. Quelle: Fitzenberger und Lickleder (2015), eigene Darstellung.

Zusatzunterricht, wird deutlich, dass aus beiden Gruppen – mit und ohne Teilnahme – ein vergleichbarer Anteil den Weg in die Ausbildung geht. Es zeigt sich darüber hinaus, dass mit einer Teilnahme am Zusatzunterricht auch häufiger der Übergang in Klasse 10 und in eine Berufsfachschule gelingt. Umgekehrt münden aus der Gruppe ohne Zusatzunterricht mehr als 40 Prozent in das Übergangssystem ein.

Tabelle 2.2: Übergang je nach Teilnahme an Zusatzunterricht und Notenentwicklung

	a) Übergang nach Klasse 9 (in Prozent)			b) Notenentwicklung (Deutsch und Mathematik)		
Übergang	gesamt	Mit ZU	Ohne ZU	Klasse 7	Klasse 9	Verbesserung
Ausbildung	10,62	11,56	9,62	3,01	2,98	0,03
Klasse 10 (WRS)	12,01	18,22	5,29	2,62	2,59	0,03
Berufsfachschule	47,58	59,11	35,10	2,92	2,64	0,28
Berufsvorbereitung	25,40	8,89	43,27	3,49	3,63	-0,14
Sonstiges	4,39	2,22	6,73	3,06	3,25	-0,19
gesamt				3,05	2,95	0,10

Anmerkungen: ZU = Zusatzunterricht, WRS = Werkrealschule. a) n=433. Am Zusatzunterricht nimmt ein Anteil von 53 Prozent teil (n=225). In der Kategorie ohne Zusatzunterricht (n=208) sind auch Schüler mit fehlender Teilnahmeinformation enthalten. b) n=410. Es wird die Differenz zwischen der Note in Klasse 7 und der Note in Klasse 9 berechnet. Somit stehen positive Zahlen für den Absolutwert der Notenverbesserung und negative Zahlen für eine Notenverschlechterung. Quelle: Eigene Berechnungen auf Basis von Fitzenberger und Lickleder (2015).

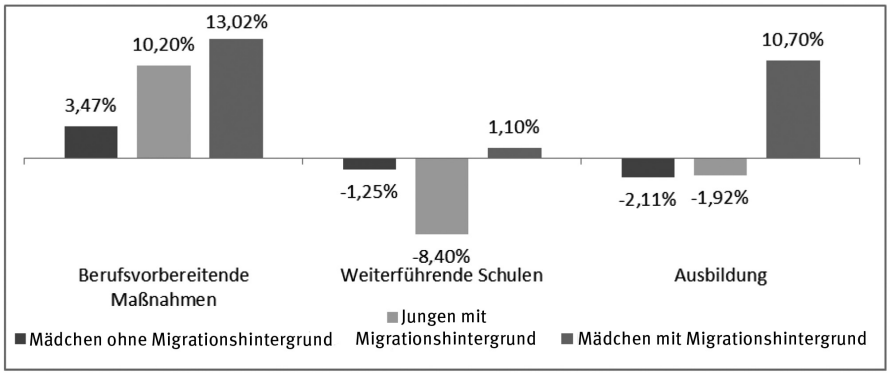
Welche Schülercharakteristika und Maßnahmen der Berufsorientierung stehen in einem Zusammenhang mit dem Übergang nach der Hauptschule? Abbildung 2.3 zeigt den durchschnittlichen Effekt auf den direkten Übergang in die Ausbildung, in das Übergangssystem berufsvorbereitender Maßnahmen und in weiterführende Schulen (Werkrealschulen, Klasse 10 und Berufsfachschulen) in Prozentpunkten auf Basis multivariater Probit-Schätzungen. Jungen mit Migrationshintergrund (+10,20) und Mädchen ohne Migrationshintergrund (+3,47) gehen häufiger in das Übergangssystem über. Interessanterweise hebt sich für Mädchen mit Migrationshintergrund der Effekt teilweise auf; sie beginnen eher eine Ausbildung. Der Übertritt in weiterführende Schulen geht mit besseren sozialen und kognitiven Fähigkeiten sowie besseren Schulnoten einher. Ebenso wirkt eine Verbesserung in der Selbständigkeit in der Berufsplanung positiv (+7,13).

Ob ein Wunschberuf vorhanden ist, spielt ebenfalls eine Rolle für den Übergang nach der Hauptschule. Die Ergebnisse legen nahe, dass Jugendliche, die eine weiterführende Schule anstreben, die Festlegung auf einen Wunschberuf vertagen. Eine deutliche Verbesserung der Berufsplanung (+11,30) und das Absolvieren von Praktika in Klasse 9 (+4,11) gehen damit einher, dass die Jugendlichen häufiger eine Ausbildung beginnen. Die hier beschriebenen Zusammenhänge verändern sich kaum, wenn man in der multivariaten Probit-Schätzung die Durchschnittsnote am Ende der Klasse 7 berücksichtigt. Die Note selbst zeigt einen signifikant positiven (negativen) Zusammenhang mit einem Übergang in das Übergangssystem, also in weiterführende Schulen, aber keinen Zusammenhang mit dem Übergang in Ausbildung.

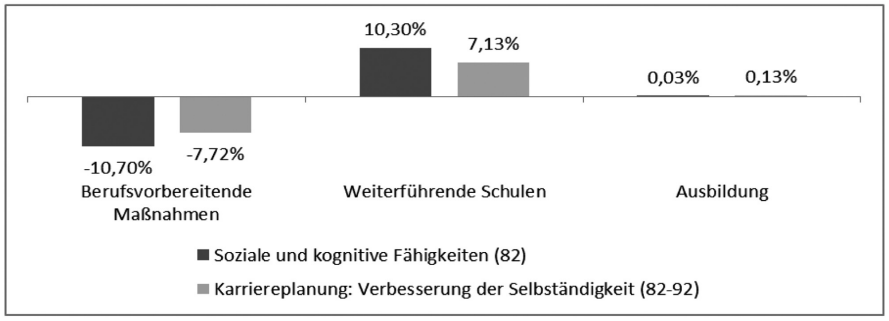
Im Hinblick auf die Notenentwicklung ergibt sich, dass für Schüler, die direkt eine Ausbildung beginnen, die Durchschnittsnote mit 3,0 in der Mitte der gesamten Notenverteilung liegt (siehe Tabelle 2.2, Spalte b). Sowohl diese Schüler als auch Schüler, die in Klasse 10 übergehen, halten über die letzten zwei Jahre in der Hauptschule ihren Notendurchschnitt. Eine deutliche Notenverbesserung erreichen Schüler, die in Berufsfachschulen wechseln. Sie erreichen mit durchschnittlich 2,64 am Ende von Klasse 9 nahezu das

Abbildung 2.3: Ausgewählte Determinanten der Übergänge in Übergangssystem, weiterführende Schulen und Ausbildung (durchschnittliche marginale Effekte)

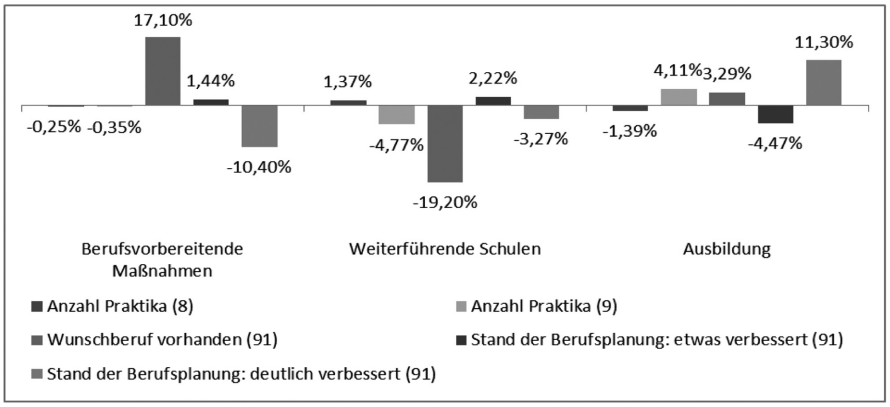
a) Geschlecht und Migrationshintergrund



b) Soziale und kognitive Fähigkeiten und Verbesserung der Selbständigkeit in der Berufsplanung



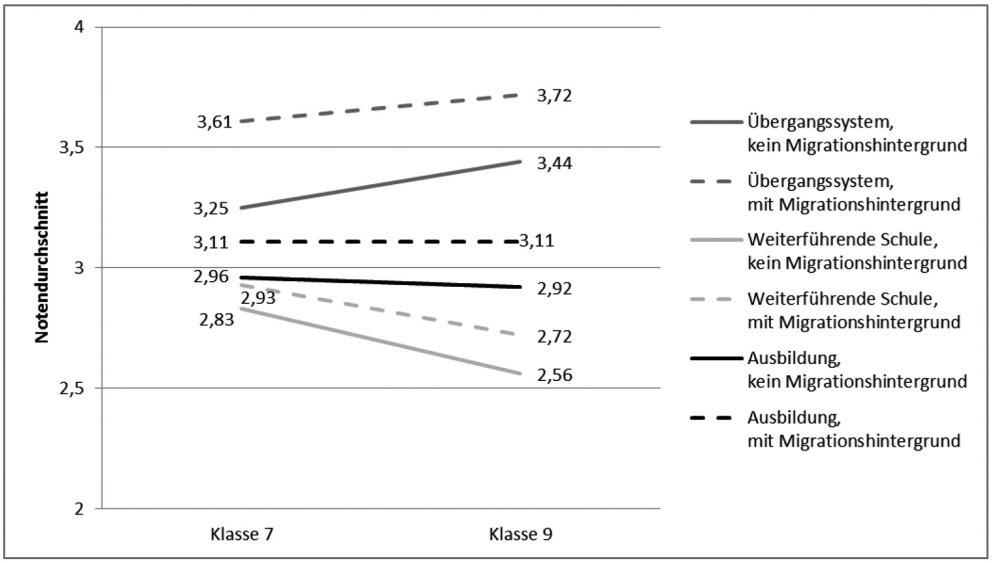
c) Anzahl Praktika 8./9. Klasse, Wunschberuf bekannt, Verbesserung der Berufsorientierung



Anmerkungen: (8)/(9) = achte/neunte Klasse. (82)/(91): Die Variable wurde in der achten Klasse, zweites Halbjahr/neunten Klasse, erstes Halbjahr gemessen. (82–92) Variable bezeichnet die Veränderung zwischen der achten Klasse, zweites Halbjahr, und der neunten Klasse, zweites Halbjahr. Quelle: Fitzenberger und Lickleder (2015, Tabelle 8, Probitschätzung für jeden Übergang, Spezifikation kontrolliert für Variablen der Berufsorientierung während Klasse 8 und 9 sowie persönliche Charakteristika), eigene Berechnungen.

Notenniveau der Werkrealschüler. Die Schüler, die in das Übergangssystem einmünden, weisen schon in Klasse 7 schlechtere Noten auf (3,49), und diese gehen bis zum Abschluss der Hauptschule noch weiter bergab.

Abbildung 2.4: Entwicklung der Durchschnittsnote Deutsch/Mathematik zwischen Klasse 7 und 9, unterschieden nach Übergängen



Anmerkungen: Die Linien stellen die Notenentwicklung zwischen Ende der 7. Klasse und Ende der 9. Klasse dar, unterschieden nach Übergängen und Migrationshintergrund. Weiterführende Schule: Berufsfachschule oder 10. Klasse Werkrealschule. Ein Rückgang zeigt eine Notenverbesserung an, eine Erhöhung eine Notenverschlechterung. Quelle: Fitzenberger und Lickleder (2015), eigene Berechnungen und eigene Darstellung.

Abbildung 2.4 zeigt die Notenentwicklung, unterschieden nach den drei konsolidierten Übergangsarten (Ausbildung, weiterführende Schulen, Übergangssystem) und Migrationshintergrund. In allen drei Übergangsarten ist das Notenniveau von Jugendlichen mit Migrationshintergrund schlechter als ohne Migrationshintergrund. Die Verläufe zwischen Klasse 7 und Klasse 9 sind jedoch nahezu parallel. Weiter zeigt sich hier – wie in Tabelle 2.2, Spalte b – die Auffächerung der Notenentwicklung je nach Übergangsart. Wer in ein Übergangsystem einmündet, erlebt eine Notenverschlechterung. Die Noten verbessern sich für die Übergänge in weiterführende Schulen und bleiben beim Übergang in Ausbildung nahezu konstant. Festzuhalten ist an dieser Stelle, dass eine Notenverbesserung in einem positiven Zusammenhang mit einem Übergang in weiterführende Schulen steht, nicht aber mit einem direkten Übergang in Ausbildung nach dem Ende von Klasse 9.

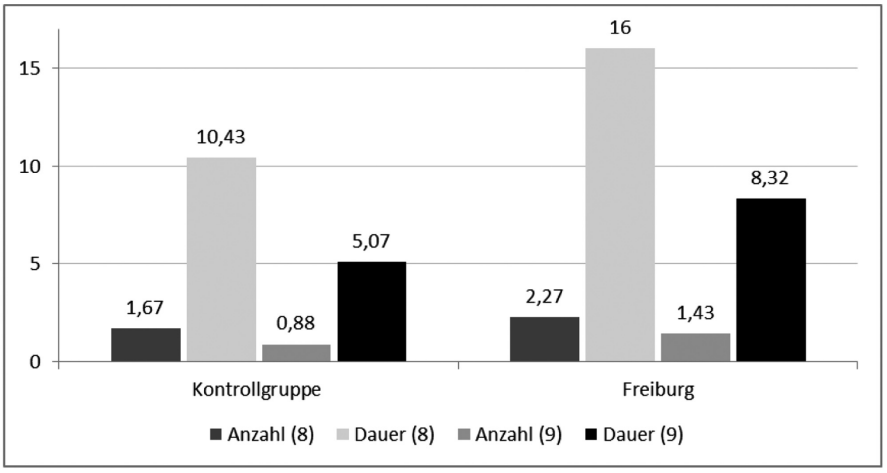
2.3.2 Effekte zusätzlicher Berufsorientierung: Kontrast von Stadt und Umland

Fitzenberger und Lickleder (2016) schätzen die kausale Wirkung der zusätzlichen Maßnahmen der Berufsorientierung im Rahmen des EiA-Projekts – im Folgenden technisch als „EiA-Intervention“ bezeichnet – auf zwei Bildungsergebnisse. Die Schätzungen basieren auf dem Kontrast zwischen der Stadt Freiburg und deren Umland, da Hauptschulen im Umland nicht Teil des EiA-Projekts waren. Neben ausgewählten Ergebnissen aus Fitzenberger und Lickleder (2016) präsentieren wir in diesem Abschnitt auch vorläufige

Ergebnisse zum Übergang in Ausbildung innerhalb von drei Jahren nach Abschluss der Hauptschule.

Zunächst betrachten wir die Wirkungen der EiA-Intervention auf die Teilnahme an Praktika in Klasse 8 und 9 (siehe Abbildung 2.5) und auf den Stand der Berufsplanung in Klasse 9 zum Ende des ersten Halbjahrs (siehe Abbildung 2.6). Im Rahmen der Berufsorientierung in Freiburg absolvieren die Schüler in Klasse 8 im Durchschnitt 2,3 Praktika mit einem durchschnittlichen Umfang von 16 Arbeitstagen, was deutlich mehr ist als das Pflichtpraktikum. In Klasse 9 geht die Anzahl auf 1,4 und die Dauer auf 8,3 Tage zurück. In der Kontrollgruppe absolvieren die Schüler in Klasse 8 im Durchschnitt 1,7 Praktika mit einem durchschnittlichen Umfang von 10 Arbeitstagen; in Klasse 9 sind es 0,9 Praktika mit einer Dauer von 5 Arbeitstagen. Es wird deutlich, dass die EiA-Intervention den Umfang der Praktika deutlich erhöht; der Unterschied ist statistisch signifikant. Der Rückgang des Umfangs der Praktika in Klasse 9 dürfte damit zu tun haben, dass sich die Schüler im Hinblick auf die weitere Berufsplanung nun eher um Bewerbungen an weiterführende Schulen und um Ausbildungsplätze kümmern. Hinsichtlich des Standes der Berufsplanung zum Ende des ersten Halbjahres in Klasse 9 geben in Freiburg 54 Prozent der Schüler an, sie seien etwas weitergekommen, und 28 Prozent, sie seien sehr viel weitergekommen. In der Kontrollgruppe sind die entsprechenden Anteile 53 Prozent und 21 Prozent. Folglich erhöht die EiA-Intervention deutlich den Anteil der Schüler, die eine sehr starke Verbesserung ihrer Berufsplanung feststellen. Insgesamt ist festzuhalten, dass die EiA-Intervention einen deutlich positiven Effekt auf die Berufsorientierung der Hauptschüler in Klasse 8 und 9 ausübt. Diese Interpretation bestätigt sich, wenn man weitere Indikatoren des Standes der Berufsorientierung zu Grunde legt.[5]

Abbildung 2.5: Anzahl und Dauer Praktika (in der 8. und 9. Klasse, Durchschnitte)

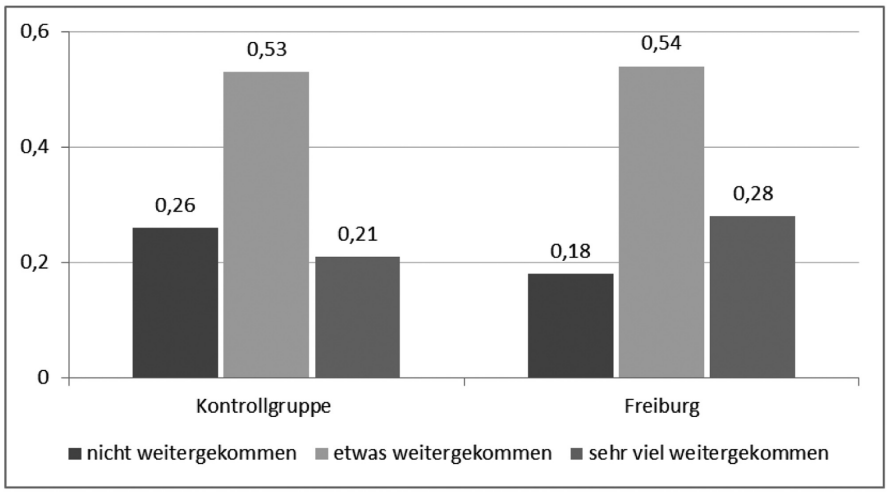


Anmerkungen: Freiburg = Treatmentgruppe Stadt Freiburg, Kontrollgruppe = Umland Freiburg. Quelle: Fitzenberger und Lickleder (2016); eigene Darstellung.

Fitzenberger und Lickleder (2016) untersuchen den Einfluss der EiA-Intervention auf a) die Durchschnittsnote in Deutsch und Mathematik am Ende Klasse 9 und b) den Erwerb der mittleren Reife (Realschulabschluss) innerhalb von drei Jahren nach Abschluss der Hauptschule. Tabelle 3 umfasst die geschätzten Treatmenteffekte je nachdem, ob

[5]Siehe Fitzenberger und Lickleder (2015, 2016) und weitere unveröffentlichte Ergebnisse, die wir auf Anfrage bereitstellen können.

Abbildung 2.6: Stand der Berufsplanung (Anteile Stand 9. Klasse, Ende erstes Halbjahr)



Anmerkungen: Freiburg = Treatmentgruppe Stadt Freiburg, Kontrollgruppe = Umland Freiburg. Quelle: Fitzenberger und Lickleder (2016); eigene Berechnungen und eigene Darstellung

Zusatzunterricht-Teilnahme bzw. Migrationshintergrund vorlag oder nicht.[6] Die Ergebnisse in Teil a) von Tabelle 2.3 zeigen für die Schüler ohne Teilnahme am Zusatzunterricht (Kein ZU) eine signifikante Verbesserung der Note um 0,25 Noteneinheiten in Folge der EiA-Intervention. Dieser Effekt ist für Schüler mit Migrationshintergrund um 0,095 Notenpunkte geringer, aber dieser Unterschied ist nicht signifikant. Demgegenüber zeigt die EiA-Intervention für Schüler mit Zusatzunterricht (ZU) einen geringen notenverschlechternden Effekt, der jedoch weit davon entfernt ist, signifikant zu sein. Dieses Ergebnis deutet auf den ersten Blick auf einen überraschenden Effekt der zusätzlichen Berufsorientierung im Rahmen der EiA-Intervention hin: Wer nicht am Zusatzunterricht teilgenommen haben, strebt eher einen direkten Einstieg in den Arbeitsmarkt an, indem er eine Ausbildung aufnimmt. Die EiA-Intervention könnte diesen Schülern die Wichtigkeit guter Noten verdeutlicht haben, so dass sie sich mehr angestrengt haben. Demgegenüber sind sich die Schüler mit Zusatzunterricht der Bedeutung guter Noten für einen Besuch weiterführender Schulen schon bewusst. Hieran ändert die EiA-Intervention nichts. Sie lenkt ihre Aufmerksamkeit auf den direkten Einstieg in den Arbeitsmarkt.

Vor diesem Hintergrund wenden wir uns nun den Ergebnissen für den Erwerb der mittleren Reife in Tabelle 2.3, Teil b) zu. Es zeigt sich, dass die EiA-Intervention die Quote der Schüler mit Zusatzunterricht, welche die mittlere Reife erwerben, um etwa 17 Prozentpunkte reduziert. Dieser Effekt hängt nicht vom Migrationshintergrund ab. Im Gegensatz dazu erhöht die EiA-Intervention bei Schülern ohne Zusatzunterricht und ohne Migrationshintergrund die Wahrscheinlichkeit signifikant um fast 12 Prozentpunkte, dass sie die mittlere Reife erwerben. Demgegenüber findet sich kein signifikanter Effekt für Schüler mit Migrationshintergrund und ohne Zusatzunterricht. Wie lassen sich diese Ergebnisse interpretieren? Bei Schülern mit Zusatzunterricht lenkt die EiA-Intervention die Aufmerksamkeit stärker auf den direkten Einstieg in den Arbeitsmarkt und damit weg vom Erwerb eines höheren Bildungsabschlusses, was mit einer Revision des ursprüngli-

[6] Fitzenberger und Lickleder (2016) berücksichtigen in ihren Regressionsanalysen das Geschlecht der Schüler. Es finden sich keine signifikanten Unterschiede in den Effekten der EiA-Intervention.

Tabelle 2.3: Übergang je nach Teilnahme an Zusatzunterricht und Notenentwicklung

a) Durchschnittsnote Deutsch/Mathematik Ende Klasse 9 (positive/negative Zahl steht für notenverschlechternden/notenverbessernden Effekt)	
Treat*ZU*Kein Migrationshintergrund	0.053 [0.07]
Treat*ZU*Migrationshintergrund	0.031 [0.13]
Treat*Kein ZU	-0.251 [0.10]**
Treat*Kein ZU* Migrationshintergrund	0.095 [0.17]
b) Kumulative Inzidenz mittlere Reife zwei bis drei Jahre nach Abschluss der Hauptschule	
Treat*ZU*Kein Migrationshintergrund	-0.165 [0.07]**
Treat*ZU*Migrationshintergrund	-0.171 [0.07]***
Treat*Kein ZU*Kein Migrationshintergrund	0.117 [0.03]***
Treat*Kein ZU*Migrationshintergrund	-0.022 [0.07]

Anmerkungen: Standardfehler in Klammern. Ergebnisse einer multivariaten Regression unter Kontrolle der persönlichen Charakteristika sowie schulische Variablen zum Beginn der 8. Klassen und Lehrereinschätzung in der 8. Klasse. Treat ist die EiA-Treatmentdummy, sprich eine Dummy-Variable für die Stadt Freiburg im Kontrast zum Umland von Freiburg. */**/***=Signifikanz auf dem 10 %-, 5 %- und 1 %-Signifikanzniveau. Quelle: Fitzenberger und Lickleder (2016), Tabelle 7 und Tabelle 10, vierte Spalte.

chen Ziels eines höheren Bildungsabschlusses einhergeht. Demgegenüber intensiviert die EiA-Intervention die Lernanstrengungen von Schülern ohne Zusatzunterricht und führt weg davon, einen direkten Einstieg in den Arbeitsmarkt anzustreben. Eine signifikante Steigerung des Erwerbs höherer Bildungsabschlüsse ist jedoch nur für Schüler ohne Migrationshintergrund festzustellen. An dieser Stelle bleibt offen, warum sich dieser Effekt nicht auch für Schüler ohne Zusatzunterricht und mit Migrationshintergrund zeigt. Hier besteht weiterer Forschungsbedarf, insbesondere angesichts der Tatsache, dass Schüler mit Migrationshintergrund überproportional in der Gruppe ohne Zusatzunterricht vertreten sind.

Die Ergebnisse von Fitzenberger und Lickleder (2015, 2016) legen nahe, dass der direkte Übergang in Ausbildung in Freiburg nach Ende der Hauptschule von untergeordneter Bedeutung ist. Ein großer Teil der Hauptschüler nimmt am Zusatzunterricht teil und strebt den Besuch einer weiterführenden Schule an, um einen höheren Abschluss zu erreichen. Umgekehrt findet sich ein großer Teil der leistungsschwächeren Schüler nach dem ersten Übergang im Übergangssystem wieder. Tatsächlich ist die Quote des direkten Übergangs in eine Ausbildung in der Kontrollgruppe mit 17 Prozent höher als in der Stadt Freiburg mit 11 Prozent und der Verbleib im Übergangssystem mit 19 Prozent deutlich niedriger. Diese Unterschiede reduzieren sich jedoch, wenn man im Rahmen einer multivariaten Regression die Unterschiede in den persönlichen Charakteristika zwischen Treatment- und Kontrollgruppe in den Blick nimmt. Erste Ergebnisse zur kumulativen Inzidenz im Übergang in eine Ausbildung während der ersten drei Jahre nach Abschluss der Hauptschule zeigen keinen signifikanten Effekt der EiA-Intervention insgesamt – auch dann nicht, wenn man nach Zusatzunterricht und Migrationshintergrund differenziert.[7] Die bisherigen Ergebnisse sind als sehr vorläufig anzusehen, da die Auswertungen der Beschäftigtenstatistik 2013 enden und nur die frühen Übergänge in die duale Ausbildung umfassen. Angesichts der Tatsache, dass viele Schüler eine weiterführende Schule besuchen oder sich zunächst im Übergangssystem wiederfinden, halten wir es für plausibel, dass weitere Schüler eine Ausbildung beginnen werden. Die Ergebnisse der Studie von Fitzenberger und Lickleder (2016) verdeutlichen, dass die EiA-Intervention signifikante Effekte auf die Bildungsergebnisse zeitigt, die sich je nach Teilnahme an Zu-

[7] Dies sind unveröffentlichte Ergebnisse, die auf Anfrage bereitgestellt werden können.

satzunterricht und Migrationshintergrund unterscheiden. Es ist daher möglich, dass die EiA-Intervention einen Einfluss auf den Zeitpunkt des Beginns der Ausbildung hat, der sich erst mit einem längeren Beobachtungszeitraum verlässlich schätzen lässt. Deshalb ist eine weitere Auswertung der Beschäftigtenstatistik zu einem späteren Zeitpunkt geplant. Zudem wäre zu gegebener Zeit von Interesse, ob die Schüler ihre Ausbildung dann auch erfolgreich abschließen konnten.

2.3.3 Schlussfolgerungen aus der Fallstudie

Die Studien von Fitzenberger und Lickleder (2015, 2016) weisen eine hohe interne Validität auf, da sie auf Verlaufsdaten aus einer kleinen Region für zwei Hauptschuljahrgänge fußen. Die einbezogenen Schüler wachsen im gleichen Arbeits- und Ausbildungsmarkt auf. Die externe Validität der Ergebnisse indes ist beschränkt. Die institutionellen Rahmenbedingungen in der Fallstudie unterscheiden sich deutlich von anderen Regionen Deutschlands. Zudem wurden die Hauptschulen im Zuge der Schulreformen in Baden-Württemberg nach 2010 in Werkrealschulen als Regelschulen umgewandelt; die Schülerzahlen in diesem Zweig schrumpfen stark. Trotzdem ergeben sich aus der Fallstudie wichtige Lehren. Erstens haben Jugendliche nur geringe Chancen, direkt nach Abschluss der Hauptschule eine duale Ausbildung zu beginnen. Deswegen sind Schüler, Eltern und Lehrer stark daran interessiert, dass ein höherer Schulabschluss erworben wird, was häufig mit einem Wechsel an eine weiterführende Schule verbunden ist.

Zweitens spiegelt sich in der EiA-Intervention in Freiburg der in Deutschland generell zu beobachtende Trend zu verstärkten Maßnahmen der Berufsorientierung an den Hauptschulen. Diese Maßnahmen verbessern zwar den Stand der Berufsplanung, gewährleisten aber keineswegs, dass Absolventen unmittelbar nach Abschluss der Hauptschule in eine Ausbildung übergehen. Dies hängt vermutlich damit zusammen, dass viele Anbieter von Ausbildungsplätzen eine höhere schulische Ausbildung voraussetzen und dass sich ein großer Teil der Schüler darauf einstellt.

Drittens gilt es dem Befund Rechnung zu tragen, dass die Berufsorientierung an den Hauptschulen bei leistungsschwächeren Schülern möglicherweise nicht erfüllbare Hoffnungen auf einen Ausbildungsplatz weckt. Es ist problematisch, dass sich viele Schüler, die sich beispielsweise in Praktika zur Berufsplanung stark anstrengen, dennoch im Übergangssystem wiederfinden. Dieses Zeichen für eine unzureichende Ausbildungsfähigkeit erleben sie vielfach als ein Scheitern. Dennoch ist es grundsätzlich positiv, dass die Verstärkung von Maßnahmen zur Berufsorientierung zu größeren Lernanstrengungen und zu höheren Bildungsabschlüssen anregt. Offen ist allerdings, ob der bei den Schülern mit Zusatzunterricht beobachtete negative Einfluss auf die Quote des Erwerbs der mittleren Reife ein Problem darstellt. Zwar verbessert der Nachweis der mittleren Reife grundsätzlich die Ausbildungsplatzchancen. Bei Schülern mit überdurchschnittlich guten Noten könnte sich die Entscheidung, mit dem Hauptschulabschluss in den Arbeitsmarkt einzusteigen, jedoch auszahlen. Um zu beurteilen, ob dies der Fall ist, müsste der weitere Arbeitsmarktverlauf anhand von Längsschnittdaten weiter untersucht werden.

2.4 Bedarf an aussagekräftigen Daten

Die Fallstudie zeigt, wie die ökonomisch basierte Berufsbildungsforschung bedeutsame empirische Erkenntnisse zu den Determinanten der Entwicklungsverläufe der Jugendlichen zwischen schulischer und dualer Ausbildung hervorbringen kann. Insbesondere ist

es möglich, die Effekte von nicht experimentell zugewiesenen Unterstützungsmaßnahmen in einer Weise zu messen, die dem Anspruch wissenschaftlicher Evaluation genügt, Ursache-Wirkungs-Beziehungen offen zu legen. Das Beispiel zeigt aber auch die Grenzen. Erstens ist wegen der großen Bedeutung des Kontextes ein regional ausgerichteter Ansatz erforderlich, was jedoch die externe Validität der empirischen Befunde einschränkt. Zweitens ist erheblicher Aufwand zu treiben, um personenbezogene Daten zu gewinnen, anhand derer sich die Entwicklungsverläufe der jugendlichen Zielgruppe über längere Zeit beobachten lassen.

Ein Grund hierfür ist, dass in der Übergangsphase bis zum Berufseinstieg eine Vielzahl staatlicher, halbstaatlicher und privater Akteure (Schulen, Agentur für Arbeit, Betriebe, freie Träger, Bildungsdienstleister etc.) nebeneinander agiert. Ihre Zuständigkeiten sind dezentral organisiert, so dass für Forschungszwecke potenziell nutzbare administrative Individualdaten, wenn überhaupt, nur punktuell und wenig systematisch vorliegen. Auch Informationen zum schulischen Werdegang oder zum familiären Hintergrund, die für den Berufseinstiegsprozess empirisch von großer Bedeutung sind, lassen sich aus administrativen Registerdaten kaum erfassen und mit Individualdaten der Jugendlichen verknüpfen. Schließlich sind Bildungs- und Berufswahlentscheidungen stark von persönlichen Charaktereigenschaften abhängig. Diese lassen sich naturgemäß meist nur auf dem Befragungsweg ermitteln.

Ein derzeit im Aufbau befindlicher personenbezogener Verlaufsdatensatz, mit dem sich die Bedingungen für die empirische Berufsbildungsforschung in Deutschland verbessern, ist das Nationale Bildungspanel (NEPS). Das NEPS dient grundsätzlich dem Ziel, Längsschnittdaten zu Bildungsprozessen, Bildungsentscheidungen und Bildungsergebnissen zu erheben (Blossfeld u. a., 2011). Mit der „Startkohorte Klasse 9“ ist es möglich, die Ausbildungswege von Jugendlichen nach Ende der neunten Jahrgangsstufe des allgemeinbildenden Schulsystems zu beobachten. Eine Stärke des NEPS liegt in der differenzierten Diagnose von Kompetenzen, die für den Bildungserfolg und für den Erfolg beim Eintritt in den Beruf wichtig sein können. Einschränkungen ergeben sich jedoch aus dem Anspruch, dass die Daten bevölkerungsrepräsentativ sein sollen. Deswegen sind die Fallzahlen im NEPS zu gering, um die Wirkungen spezifischer Instrumente und Institutionen zu evaluieren. Deswegen erfasst das Erhebungsprogramm solche Interventionen auf der Personenebene auch gar nicht im Detail. Darüber hinaus sind regional vergleichende Analysen, welche die Einflüsse des Kontextes (beispielsweise der Wirtschaftsstruktur und der lokalen Angebote für Maßnahmen zur Unterstützung der Berufsfindung von Jugendlichen) angemessen berücksichtigen und gleichzeitig die betriebliche Ebene im Fall einer dualen Ausbildung erfassen, bislang nur äußerst eingeschränkt möglich.

Ein von der ökonomischen Berufsbildungsforschung wenig beachteter Verlaufsdatensatz ist das vom Deutschen Jugendinstitut (DJI) mit insgesamt zehn Befragungswellen von 2004 bis 2009 durchgeführte Übergangspanel (vgl. Kuhnke, 2005; Reißig u. a., 2006). Es basiert auf einer Eingangsbefragung von 4.000 Schülern in den Abschlussklassen an Hauptschulen. Anschließend hat das DJI den weiteren Weg der Schüler durch das Bildungs- und Ausbildungssystem verfolgt. Der Fokus dieser Kohortenstudie liegt darauf, die Entwicklung von benachteiligten Jugendlichen greifbar zu machen, von denen viele in das Übergangssystem einmünden. Deshalb zählen auch die Inanspruchnahme und die Effekte schulischer und außerschulischer Förder- und Unterstützungsangebote zu den Untersuchungsleitfragen, wobei für Wirkungsanalysen passende Kontrollgruppen anhand beobachteter Merkmale aus den Daten konstruiert werden müssen. Ein konstruktionsbedingter Nachteil der Übergangspanels ist, dass vergleichende Analysen der Entwicklung von Schülern, die aus unterschiedlichen Schultypen stammen, ausgeschlossen sind. Ein

weiterer Nachteil ist das mittlerweile recht hohe Alter der Daten. Angesichts der strukturellen Veränderungen am deutschen Arbeitsmarkt, in den Schulsystemen der Länder, von denen gerade die Hauptschulen betroffen waren, und möglicherweise auch der Präferenzen und Haltungen der Jugendlichen (Calmbach u. a., 2016) erscheint es fraglich, inwieweit sich die aus dem Übergangspanel des DJI zu gewinnenden Erkenntnisse noch auf die derzeitigen Verhältnisse übertragen lassen.

Deswegen wäre es nützlich, in Deutschland ein aktuelles Übergangspanel aufzubauen. Ein neuer Datensatz sollte möglichst breit angelegt sein, mit einer großen Stichprobe von Schülern aus den Abschlussklassen aller Schulformen des allgemeinbildenden Systems sowie aus den einjährigen Berufsschulklassen der verschiedenen Teile des Übergangssystems (Berufsvorbereitungsjahr, Berufseinführungsjahr, Vorbereitungsjahr Arbeit und Beruf, berufsvorbereitende Maßnahmen). So entstünde eine hinsichtlich Alter, Bildungs- und Erwerbschancen heterogene Eingangskohorte, was im weiteren Panelverlauf ein vielfältiges Spektrum an Übergängen erwarten ließe. Auf diese Weise würde es möglich, Einflüsse unterschiedlicher Startbedingungen für den weiteren Bildungsverlauf und den beruflichen Werdegang herauszuarbeiten.[8]

Ein neues Übergangspanel kann gegenüber einer repräsentativ angelegten Kohortenstudie wie dem NEPS einen essentiellen analytischen Mehrwert schaffen, indem es sich trotz einer großen Eingangskohorte auf eine kleine Zahl ausgewählter regionaler Einheiten beschränkt. Die Idee einer regionalen Clusterung trägt der Erwartung Rechnung, dass Ausbildungswege und Berufseinstiegsprozesse junger Menschen wesentlich von Intensität und Qualität der Bildungsangebote in ihrem Umfeld abhängen, von Art und Effektivität der bildungs- und berufsbezogenen Informations- und Förderangebote sowie von Struktur und Dynamik der Nachfrage nach Auszubildenden und der Beschäftigungsmöglichkeiten für Berufseinsteiger auf dem regionalen Arbeitsmarkt. Diese Größen streuen regional ganz erheblich, und zwar nicht nur wegen unterschiedlicher wirtschaftlicher und soziostruktureller Voraussetzungen, sondern auch in Folge verschiedenartiger institutioneller Rahmenbedingungen. So sind die Übergangssysteme und die Ausgestaltung der Übergangsmöglichkeiten zwischen schulischer und beruflicher Bildung je nach Bundesland verschieden. Unterstützungs- und Informationsangebote sind überwiegend dezentral organisiert und können daher von Kommune zu Kommune stark variieren.

Ein regional geclustertes Übergangspanel kann gewährleisten, dass die Daten für die Identifikation von Ursache-Wirkungs-Beziehungen eine wünschenswerte Varianz in den lokalen Ausbildungsstrukturen, Unterstützungsangeboten und arbeitsmarktrelevanten Makrovariablen abbilden. Zudem lassen sich lokale Einflüsse, die auf die Jugendlichen einwirken, sehr viel tiefer und konkreter beschreiben als in einer flächendeckenden Studie. Die wirtschaftlichen und institutionellen Rahmenbedingungen, die in den einbezogenen Kommunen gegeben sind, können vorab erfasst und in die Erhebungsinstrumente eingebracht werden. So entsteht eine Basis, auf der man bewerten kann, welche Unterstützungsangebote und lokalen Rahmenbedingungen wirksam darin sind, junge Menschen auf günstigere Entwicklungspfade zu heben.

Um diese Untersuchungsziele gut zu erreichen, gilt es die Auswahl der in ein neues Übergangspanel einbezogenen Regionen sehr sorgfältig zu planen. Eine mögliche Variante

[8] Eine andere Möglichkeit bestünde darin, wie das NEPS eine Kohorte von Jugendlichen der 9. Jahrgangsstufe zu begleiten. Das erfordert aber wegen der vielfältigen anschließenden Übergangsmöglichkeiten eine erheblich größere Eingangsstichprobe und hat auch zur Folge, dass Übergänge in Ausbildung oder Beschäftigung bei denjenigen, die weiterführende schulische Bildungswege gehen, erst nach längerer Zeit im Panel beobachtet werden.

besteht darin, die Auswahl auf Flächenländer zu beschränken, damit man Unterschiede auf lokalen Ausbildungsmärkten innerhalb eines von der Landespolitik vorgegebenen übergeordneten Rahmens untersuchen kann. Für entsprechende Wirkungsanalysen sind dabei die Regionen an der Grenze zwischen Bundesländern von besonderem Interesse, da die institutionellen Bedingungen variieren, die Ausbildungsmärkte jedoch grenzüberschreitend integriert sind.

Wenn man bei einer Länderauswahl auf möglichst starke Kontraste abhebt, bieten sich Baden-Württemberg, Hessen und Thüringen besonders an. Baden-Württemberg weist den im Ländervergleich höchsten Anteil an Jugendlichen im Übergangssystem auf. Das Übergangssystem nimmt hier mehr als ein Drittel der Neuzugänge in das berufliche Bildungssystem auf (Bertelsmann-Stiftung, 2015a). Die hohen Erfolgsquoten der Berufsfachschüler relativieren diesen ungünstigen Wert allerdings deutlich. Insgesamt besticht Baden-Württemberg mit den höchsten Absolventenquoten Deutschlands, was für eine gute Qualität des beruflichen Ausbildungssystems spricht. Zudem ist Baden-Württemberg durch eine große Vielfalt schulischer und beruflicher Bildungsformen geprägt und bietet damit gute Möglichkeiten, von einem Bildungsweg auf einen anderen zu wechseln.

Für Hessen bemängelt im Gegensatz dazu die Fachkräftekommission Hessen (2012) eine mangelnde Durchlässigkeit zwischen schulischen und beruflichen Bildungswegen. Weißhaupt u. a. (2012) diagnostizieren im Übergangssystem ineffiziente Parallelstrukturen sowie Überkapazitäten, weshalb das System zurückgebaut werden solle. Zugleich blieb in Hessen anders als in anderen Ländern die Zahl von Neuzugängen in das Berufsausbildungssystem relativ konstant, da hier in der ausbildungsrelevanten Altersgruppe unter den Flächenländern der höchste Anteil an Personen mit Migrationshintergrund vorzufinden ist. Zugleich stehen weniger betriebliche Ausbildungsplätze zur Verfügung, als nachgefragt werden.

Thüringen schließlich zeichnet sich durch die höchste Beschäftigtenquote in der Produktion sowie durch den höchsten Beschäftigtenanteil mit Aus- und Fortbildungsabschluss aller Bundesländer aus. Weil die Schüler der beruflichen Ausbildung einen hohen Stellenwert zuordnen, sind die Ausgaben für berufliche Schulen im Ländervergleich deutlich überdurchschnittlich. Allerdings sind die Quoten der Jugendlichen, die eine berufliche Ausbildung erfolgreich abschließen, unterdurchschnittlich. Zugleich ist in Thüringen – typisch für die ostdeutschen Flächenländer – das Übergangssystem im Vergleich zu Westdeutschland wenig ausgebaut (Bertelsmann-Stiftung, 2015c).

Die Chancen am lokalen Arbeitsmarkt können für Jugendliche wichtig sein, wenn sie ausbildungsrelevante Entscheidungen treffen. Darum sollte man die Teilnehmer an einem Übergangspanel gezielt so auswählen, dass sie bestimmte Ausbildungsmarkttypen repräsentieren. Das Institut für Arbeitsmarkt- und Berufsforschung (IAB) hat eine wissenschaftlich basierte Typisierung auf Grundlage von Strukturbedingungen entwickelt, um regionale Ausbildungsmärkte vergleichbar zu machen (Kleinert und Kruppe, 2012). Es unterscheidet auf der Ebene der Arbeitsagenturbezirke vier Haupttypen von regionalen Ausbildungsmärkten: die Bezirke im Osten mit sehr wenigen Schulabgängern und hoher Arbeitslosigkeit; dynamische Großstädte im Westen und deren Umgebung; Bezirke im Westen mit großbetrieblicher Umgebung; Bezirke im Westen ohne großbetriebliche Umgebung und mit niedriger Arbeitslosigkeit. Die Arbeitsagenturbezirke, für die diese Klassifizierung der regionalen Ausbildungsmärkte durch das IAB existiert, sind Teil der Gebietsstruktur der Bundesagentur für Arbeit; sie umfassen im Allgemeinen mehrere Kreise, einen Kreis oder eine kreisfreie Stadt. Um das Übergangspanel hinreichend nahe an die Ebene der Akteure heranzurücken, müsste die regionale Auswahl von der Ebene der Arbeitsagenturbezirke immer auf die Ebene einzelner Kreise oder kreisfreier Städte

hinunter geführt werden. Dieser Schritt ermöglichte eine weitere Schichtungsebene, indem städtische Verdichtungsräume, eher städtische Räume und ländliche Räume nach der Einwohnerdichte voneinander abgegrenzt würden.

Eine Konzentration der Auswahl auf Großstädte und ihr jeweiliges Umland wäre eine alternative Basis für den Aufbau eines regional geclusterten Übergangspanels. Konkret bietet sich hierfür beispielsweise eine Kontrastierung zwischen den Metropolen Berlin, Hamburg und Stuttgart und den angrenzenden Regionen in Brandenburg, Niedersachsen und Baden-Württemberg an. Die drei genannten großstädtischen Räume mit ihren Einzugsgebieten unterscheiden sich stark hinsichtlich Wirtschaftskraft und Wirtschaftsstruktur. Die Bedeutung des verarbeitenden Gewerbes und der MINT-Ausbildungsberufe (Mathematik, Informatik, Naturwissenschaft und Technik) ist in Stuttgart sehr viel größer als in den von qualifizierten und hochqualifizierten Dienstleistungsbeschäftigten geprägten Metropolen Berlin und Hamburg. Berlin und das Umland in Brandenburg sind im Vergleich zu den beiden anderen Metropolregionen durch einen geringen Anteil an jungen Menschen im dualen Ausbildungssystem und durch ein weniger gut entwickeltes Unterstützungssystem für Jugendliche gekennzeichnet. In der Berufsbildungspolitik wird Hamburg eine Vorbildrolle zugeschrieben, das überdurchschnittlich viel in berufliche Schulen und vor allem ins Übergangssystem investiert. Zudem hat das Land Schritte unternommen, das System der Unterstützungsangebote im Übergang zwischen Schule und Beruf zu vereinfachen (vgl. Bertelsmann-Stiftung, 2015b).

Die analytischen Potenziale eines regional geclusterten Übergangspanels lassen sich noch steigern, indem man die personenbezogenen Befragungsdaten mit weiteren Informationen anreichert. Wünschenswert ist es dabei erstens, die am Ort vorhandenen Unterstützungsstrukturen und ausbildungspolitischen Strategien durch eine Erhebung bei den relevanten politischen und gesellschaftlichen Akteuren und Trägern systematisch zu erfassen. Zweitens können Arbeitgeber relevante Auskünfte geben, die das Bild der nachfrageseitigen Bedingungen, die auf die Entwicklungsverläufe und Übergangsentscheidungen junger Menschen einwirken, über die in den üblichen Arbeitsmarktstatistiken zugänglichen Daten hinaus ergänzen. Von Interesse sind insbesondere Einschätzungen der Arbeitgeber zur Qualität und Struktur des lokalen Angebots an Neuzugängen an Auszubildenden und Berufseinsteigern sowie zur Qualität spezifischer Bildungs- und Unterstützungsangebote. Beispielsweise könnten die Arbeitgeber eine generelle Bewertung der Einrichtungen abgeben, aus denen Teilnehmer des Übergangspanels stammen. Damit ließe sich der Hypothese nachgehen, dass Jugendliche, die Schulen mit lokal schlechterem Ruf absolviert haben, unabhängig von ihren persönlichen Merkmalen systematisch schlechtere Entwicklungsverläufe nehmen, was auf (statistische) Diskriminierung hindeuten könnte.

Schließlich sollte man per Befragung zu gewinnende Verlaufsinformationen mit amtlichen Individualdaten der Bundesagentur für Arbeit verknüpfen, um Lebensverlaufsanalysen zu ermöglichen. Eine Einwilligung der Befragten vorausgesetzt, sind Verknüpfungen von Umfragedaten mit registrierten Beschäftigten und Leistungsempfängerdaten mittlerweile gut machbar (siehe Abschnitt 2.3). Auf diese Weise lassen sich die langfristigen Arbeitsmarktkarrieren einer Startkohorte von Jugendlichen, soweit sie in der Beschäftigtenstatistik und der Arbeitslosenstatistik der Bundesagentur für Arbeit erfasst sind, ohne allzu großen Aufwand im Prinzip bis zum Eintritt in die Rente gut verfolgen. Dies schafft die Voraussetzungen dafür, die Nachhaltigkeit des Einflusses von Ausgangsbedingungen und politischen Eingriffen zu evaluieren.

2.5 Perspektiven für die ökonomische Berufsbildungsforschung

Der Lebensabschnitt vom Ende der Schulzeit bis zum Berufseinstieg ist nicht nur eine Zeit bedeutender persönlicher Weichenstellungen, sondern auch volkswirtschaftlich von größter Bedeutung. Schwierigkeiten, eine adäquate Ausbildung zu finden oder den zu den Fähigkeiten passenden Beruf zu wählen, können nachhaltig Spuren hinterlassen, wie Arulampalam u. a. (2000) sowie Biewen und Steffes (2010) schreiben. Wenn Menschen ihre Humankapitalpotenziale nicht richtig entwickeln, birgt dies Beschäftigungs- und Einkommensrisiken im weiteren Lebensverlauf, die über den einzelnen hinaus ausstrahlen, zum Beispiel auf die Sozialhaushalte und die materielle (Un-)Gleichheit in der Gesellschaft. Die damit verbundenen Probleme zeigen sich markant in den vielen Ländern, die mit einer fortgesetzt hohen Jugendarbeitslosigkeit und qualifikatorischem „Mismatch“ zu kämpfen haben.

In Deutschland gelingt jungen Menschen der Arbeitsmarkteinstieg im internationalen Vergleich gesehen zwar weiterhin gut. Die bestehenden strukturellen Probleme sollte man dennoch nicht übersehen. Der Anteil junger Erwachsener, die formal ohne Berufsabschluss bleiben, nimmt nur sehr langsam ab. Weiterhin zählt jeder siebte 20- bis 34-Jährige als nicht formal qualifiziert (BiBB, 2016). Leistungsschwächere können offenbar auch nicht ohne Weiteres vom starken Trend zur Hochschulausbildung profitieren und jene Ausbildungsplätze ergattern, die wegen des wachsenden Anteils an Studenten unbesetzt bleiben. Das Ergebnis sind Ungleichgewichte auf dem Markt für duale Ausbildung, die sich in Zukunft demografisch bedingt noch vergrößern könnten. Wie die Unternehmen auf Schwierigkeiten reagieren, Ausbildungsplätze adäquat zu besetzen, ist angesichts bestehender Fachkräfteengpässe offen. Eine durchaus mögliche Reaktion besteht darin, dass sie weniger betriebliche Ausbildungsmöglichkeiten anbieten, was das bisher insgesamt erfolgreiche duale System schwächen würde.

Vor diesem Hintergrund kann die ökonomisch basierte Berufsbildungsforschung, die primär empirische Forschung ist, wichtige Evidenz zur Gestaltung gelingender Ausbildungs- und Übergangswege zwischen Schule und Beruf liefern. Weil das duale Berufsausbildungssystem international eine Besonderheit darstellt, muss sie dafür auf den spezifischen deutschen Kontext ausgerichtet sein. Während die persönlichen Merkmale der Jugendlichen, die eine erfolgreiche Bewältigung der Ausbildungsphase und des Berufseintritts unterstützen, recht gut erforscht sind, ist der Erkenntnisbedarf zu anderen wichtigen Fragen bislang nicht ausreichend gedeckt.

Erstens mangelt es an validen Analysen zur Wirksamkeit der vielen staatlichen Programme und Maßnahmen, die vor allem die Ausbildung und die berufliche Entwicklung leistungsschwächerer Jugendliche fördern sollen. Empirische Untersuchungen müssen hier den Standards der Evaluationsforschung genügen und es ermöglichen, Ursache-Wirkungs-Beziehungen zu identifizieren und zu schätzen. Da die Teilnahme an einer Förderung im Allgemeinen nicht zufällig erfolgt, gilt es Selektivitätsprobleme zu lösen, im Regelfall durch die Bildung adäquater Kontrollgruppen, was in Anbetracht der Vielzahl sich überlappender Maßnahmen in diesem Bereich eine besondere Herausforderung darstellt. Soweit sich Zielgrößen nur langsam verändern oder im Entwicklungsprozess selbst verstärken können, müssen Evaluationsstudien eine möglichst lange zeitliche Perspektive einnehmen.

Zweitens gibt es noch zu wenig Erkenntnisse darüber, wie sich die Rahmenbedingungen des Schul- und Ausbildungssystems – die in Deutschland primär auf der Länderebene festgelegt werden, aber auch noch innerhalb der Länder lokal variieren können – auf

die beruflichen Entwicklungschancen von Jugendlichen auswirken. Der lokale Bezugsrahmen spielt für Analysen von beruflichen Bildungs- und Einstiegsprozessen eine besondere Rolle, da die Mobilität von Schulabgängern, die in den Arbeitsmarkt eintreten wollen, beschränkt ist und zugleich die Rahmenbedingungen, die sie vor Ort vorfinden, sehr unterschiedlich sein können. Deswegen wäre es auch eine wichtige Aufgabe, den Einfluss der Lage am lokalen Arbeits- oder Ausbildungsmarkt auf die beruflichen Ziele oder Entwicklungswege junger Menschen besser zu erforschen. Um hier größere Fortschritte zu erzielen, wäre – wie für die Evaluation der dezentral vermittelten Fördermaßnahmen – allerdings zunächst eine verbesserte Individualdatenbasis notwendig, wozu insbesondere beitragen könnte, ein regional geclustertes Übergangspanel aufzubauen. Die Forschungspotenziale eines solchen Übergangspanels zeigt die Fallstudie für die Region Freiburg exemplarisch.

Drittens gibt es angesichts der rapiden Verschiebungen zwischen Ausbildungs- und Hochschulsystem und der sich demografisch bedingt verändernden Jahrgangsstärken einen fortgesetzten Bedarf, die Renditen beruflicher Ausbildung und ihre Veränderungen zu messen. Dabei ist von Interesse, wie sich die Erträge einer dualen Berufsausbildung zu den Erträgen der Hochschulbildung verhalten, und auch wie hoch die spezifischen Erträge bestimmter Berufsausbildungen im dualen System ausfallen.

Schließlich erscheint es als lohnende Herausforderung für die ökonomische Berufsbildungsforschung, näher der Frage nachzugehen, ob, inwiefern und aus welchen Gründen Jugendliche und Eltern Entscheidungen treffen, die augenscheinlich nicht mit einer rein rationalen Abwägung des individuellen Nutzens und Aufwands beruflicher Bildung im Einklang stehen. Wenn junge Leute begrenzt rational oder sogar irrational über ihre berufliche Ausbildung entscheiden, ergeben sich besondere Anforderungen für die Gestaltung von Politik und Institutionen, um Verhaltensbarrieren abzubauen, welche die individuelle Wohlfahrt mindern können. Dies spricht dafür, sich auch in der Berufsbildungsforschung für verhaltensökonomische Perspektiven zu öffnen. So könnte die ökonomische Forschung auf diesem Gebiet näher an die psychologischen, erziehungswissenschaftlichen und soziologischen Ansätze heranrücken, die in der deutschen Berufsbildungsforschung immer noch vorherrschen.

3 Different Counselors, Many Options: Career Guidance and Career Plans in Secondary Schools *

3.1 Introduction

Adolescents make far reaching decisions under considerable uncertainty regarding the continuation of education and the transition into the labor market after graduation from secondary schools (Harmon et al., 2003; Heckman et al., 2018; McNally, 2016). Career guidance assists students in making these decisions by providing career related information, counseling, mentoring, or first hand work experience. Whereas counseling and mentoring mostly aim to provide information and advice, work experience placements allow students to learn about work organization in general as well as specific occupations and employers offering apprenticeships. Lower track students[1] are the most intensively targeted group for career guidance in Germany because of the increasing difficulties they face during school-to-work transitions, despite the very good general labor market conditions (BMBF, 2018; Bonin, Fitzenberger, et al., 2016). Furthermore, career guidance has been expanded in the middle and upper track of secondary schools in Germany.[2] To our knowledge, there is only a scarce literature estimating the effects of counseling on the path choice below tertiary education, which amounts to a choice between a continuation of general schooling and a vocational track.

This paper analyzes the take-up of career counseling and work experience placements as well as their effects on career planning, based on a survey we conducted in lower and middle track secondary schools in Germany. Focusing on the differences across school tracks, we analyze different types of career guidance activities and their effect on different career planning outcomes. This way we account for the different potential pathways of the school-to-work transitions in Germany below tertiary-level education.

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[1] In our setting, the lower track is 'Werkrealschule', the successor of the former 'Hauptschule', the middle track 'Realschule', and the upper track 'Gymnasium'. Lower and middle track students traditionally finish general schooling after 9^{th} or 10^{th} grade respectively, transitioning into vocational training. The upper track continues until grade 12 or 13 and prepares for tertiary-level education.

[2] Currently, the Federal Labor Agency (Bundesagentur für Arbeit) in Germany expands career guidance in upper track secondary schools as part of the initiative of Life-Long Career Counseling (LBB), (see Bundesagentur für Arbeit, 2018).

Career guidance in U.S. high schools focuses on encouraging students to attend college and assisting them with applications. In Europe, career guidance is mostly concerned with the adolescents' choice of different tracks. In most European countries, career guidance assists in making the choice between a general, more academic track and a vocational track within the school-based education system (e.g. Bernardi et al., 2014; Goux et al., 2015). Because of the crucial role of the vocational training system in Germany, career guidance in lower and middle track secondary schools targets the choice between a direct transition into vocational training, mostly by starting an apprenticeship, and continuing general schooling, often with the goal to obtain a higher school qualification,[3] and starting vocational training later (Bonin, Fitzenberger, et al., 2016). Germany requires adolescents to make this choice regarding the school-to-work transition at a young age, 15 to 16, upon graduating from lower or middle track secondary schools (Biewen and Tapalaga, 2017). Because of the importance of this choice, career guidance has been expanded over time. Hence, research on career guidance is highly relevant for Germany as well as for other European countries which have a similar system of vocational training as Germany or which view the German vocational training system as a role model.

The decision to start an apprenticeship in Germany involves the choice among more than 300 apprenticeship occupations and the timing of the entry into the labor market has lasting consequences on later life outcomes (Bonin, Fitzenberger, et al., 2016; Hanushek et al., 2017). This complex decision is made under imperfect information and uncertainty. Behavioral economics suggests that at this young age it is unlikely that individuals make rational decisions regarding human capital investments (DellaVigna, 2009; Golsteyn et al., 2014; Goux et al., 2015; Koch et al., 2015; Lavecchia et al., 2016) - and the same argument applies with regard to career choices (Bonin, Fitzenberger, et al., 2016). While career guidance in Germany has the long-term goal of a smooth and successful school-to-work transition, short- and medium-term goals are more complex, having to accommodate the students' decision process. The short-term measures assist students in career planning, forming realistic expectations and aspirations, and making timely career-related choices. The medium-term goals are ambiguous as to whether a direct transition into an apprenticeship or a continuation of general schooling is the preferable choice.

Evidence on the effectiveness of career guidance based on randomized controlled experiments is mixed. Various studies find that providing students with information on returns to tertiary education, support with applying for financial aid, and individual mentoring show positive short-run effects on graduations from high school, applications for college, and college attendance (Bettinger et al., 2012; Carell and Sacerdote, 2017; Ehlert et al., 2017; Peter and Zambre, 2017; Rodríguez-Planas, 2012). Long-run effects are much smaller and/or non-significant (Bettinger et al., 2012; Rodríguez-Planas, 2012). Evidence for Finland shows no effect on applications or enrollment in post-secondary education when providing additional information on the returns of different degree options and on the associated occupations to be working in (Kerr et al., 2015). Randomized experiments typically measure the causal effect of small scale treatments designed by researchers, where typically all participants in the treatment arm receive the treatment. Such studies provide limited insights on the take-up of existing large scale non-mandatory career guidance activities and the effects of take-up on different

[3] This means graduating with a second school leaving certificate from the next higher school track. I.e. for lower track students upgrading from lower secondary school qualification ('Hauptschulabschluss') to middle secondary school qualification ('Mittlere Reife') and for middle track students upgrading from middle secondary school qualification to higher education entrance qualification ('(Fach-)Hochschulreife').

outcomes. Our study uses nonexperimental regression analyses to estimates the impact of such counseling practices as applied in the field, thus complementing the experimental evidence.

Existing non-experimental studies tend to find positive effects of career guidance. Neumark and Rothstein (2007) and Boockmann and Nielen (2016) show that counseling programs that assist low-performing students with educational decisions and applications improve labor entry. Bernardi et al. (2014) and Fitzenberger and Lickleder er (2017) find that additional career assistance in secondary school results in a revision of education plans, possibly through a growing awareness of opportunities and risks. Hoest et al. (2013) and Saniter et al. (2019) find that professional, standardized career guidance increases educational attainment. For tertiary education decisions, Borghans et al. (2015) study the take-up and effectiveness of career guidance in Dutch secondary schools, which is found to increase the enrollment rate in the preferred field in university. Both, Neumark and Rothstein (2006) and Borghans et al. (2015) find that individual characteristics do little to explain take-up of career guidance.

Solga and Kohlrausch (2013) and Fitzenberger and Lickleder er (2015) investigate the effectiveness of work experience placements in Germany, which are a key component of career guidance activities in lower and middle secondary schools. Work experience placements show a positive effect on apprenticeship take-up. For the UK, work experience placements result in some positive but weak effects on career planning, employability, and wages of students (Hillage et al., 2001; Mann and Percy, 2014; Messer, 2018). Internships during secondary school in the U.S. both increase college attendance and employment after high school (Neumark and Rothstein, 2007).

Our study addresses two research questions. First, we provide evidence on the supply of different types of career guidance and on the determinants of the individual take-up and intensity of use. In Germany, career guidance is provided by schools, local initiatives, and the employment agencies, taking the form of counseling and work experience placements. Second, we estimate the effect of the take-up of career guidance activities on career plans. We conducted a school survey in two cities in Southwest Germany focusing on students in lower and middle track secondary schools at the point in time at which they chose between beginning an apprenticeship or continuing general schooling. We find that the take-up of counseling and work experience placements is barely associated with individual characteristics. Rather, differences in take-up are strongly driven by class-level effects. There is only limited evidence that students who are expected to face greater difficulties in career planning engage more intensively in career guidance activities, thus adding credibility to our nonexperimental estimates.

Career plans are measured by reporting a desired occupation, apprenticeship applications, and plans to continue schooling. For lower track students, frequent counseling by school counselors increases the probability of reporting a desired occupation, but school counseling does not affect the other measures. Further, counseling by the employment agency shows a positive effect on reporting a desired occupation and apprenticeship applications but it negatively affects plans for the continuation of schooling. Among middle track students, counseling by the employment agency has a positive effect on reporting a desired occupation, and frequent meetings increase apprenticeship applications. A higher number of work experience placements increases (reduces) apprenticeship applications (the continuation of schooling) in the middle track. A key finding is that the employment agency appears to be more effective in supporting career planning towards starting an apprenticeship.

The paper is organized as follows. Section 3.2 describes our survey. Section 3.3 provides evidence on the take-up and type of career guidance counseling and work experience placements. Section 3.4 investigates the relationship between career guidance and career planning. Section 3.5 concludes.

3.2 Data

The data was collected through use of a survey among secondary school students in 9^{th} and 10^{th} grade in spring 2014, in the two cities of Mannheim and Freiburg. Both cities are in the state of Baden-Württemberg and have the same education system. Our empirical analysis is restricted to lower track and middle track students, because after graduation these students face the choice between an apprenticeship (or school-based vocational training) and the continuation of general schooling.[4] Middle track students were surveyed in 10^{th} grade, while lower track students were surveyed both in 9^{th} and 10^{th} grade.[5]

Using a paper and pencil questionnaire, we surveyed students in the classroom, provided parents had given their consent. The use of financial incentives for participation in the classroom survey was not allowed. Under these circumstances, we had a satisfactory response rate in contacted classes of 29 %. In addition, we surveyed parents and teachers. Parents were asked about their level of education, migratory background, and educational aspirations for their children.

Table 3.1 presents descriptive statistics of the students in the sample and in the overall student population. The share of students with a migratory background and the share of females are comparable to the overall population. We oversampled lower and middle track students for whom career guidance traditionally is more important than for upper track students. Table 3.A.1 in the Appendix shows descriptive statistics for lower and middle track students separately.

Table 3.1: Representativeness of the Sample

	Mannheim		Freiburg	
	Population	Sample	Population	Sample
Lower Track	19 %	29 %	13 %	29 %
Middle Track	24 %	16 %	21 %	27 %
Upper Track	47 %	32 %	58 %	31 %
Share with Migratory Background	47 %[a]	42 %[b]	21 %[c]	22 %[c]
Female	50 %	53 %	50 %	52 %

Notes: [a] Education Report Mannheim school year 2012–2013: Population share below the age of 27 with migratory background. [b] Share of surveyed students growing up in bilingual families. [c] Online Statistics Freiburg school year 2012–2013: Population share below the age of 27 with migratory background.

3.3 Take-up of Career Guidance

For the purpose of our analysis we focus on counseling and work experience placements as career guidance activities. Counseling is provided by teachers, school-based counselors,

[4] The survey includes students from all three tracks of secondary school.
[5] Students in the lower track can finish general schooling after 9^{th} grade.

and the local employment agency. Work experience placements are common in Germany to familiarize students with work environments, with the option to gain contacts for an apprenticeship later on.

What are the determinants of take-up of career guidance activities? One hypothesis is that students receiving less support from their parents due to weaker labor market knowledge and networks as well as low-performing students are more likely to take up career guidance, because they need more support (henceforth, need-hypothesis [NH]). A second hypothesis is that schools and teachers affect the amount of career guidance that students actually use (henceforth, supply-hypothesis [SH]), because they affect students' behavior by communicating the benefit of career guidance and the importance of career planning. This section describes the observed career guidance activities and provides evidence on the determinants of take-up.

3.3.1 Counseling

Career guidance through individual counseling and coaching of secondary school students has expanded over the last few decades in Germany, especially in the lower track where it has become a major part of the school curriculum (Kohlrausch and Solga, 2012; Saniter et al., 2019). Career guidance counseling is provided by local employment agencies and within schools. Local employment agencies offer counseling at their own job information centers. In some cases, and in particular for lower track students, counselors of the employment agency offer counseling hours at schools.

In contrast, school-based career guidance counseling is typically managed by schools or local school authorities in cooperation with municipalities without being standardized across Germany. Thus, there is a lot of regional variation in the type and quantity of school-based counseling. Often, one teacher or the head teacher is in charge of career guidance for students, providing job information and some assistance with applications for work experience placements or apprenticeships. Further, there exists a large number of local programs providing additional intensive career guidance mostly targeted at the lower track. In Mannheim, the local career guidance counseling project ("Ausbildungslotsen") was extended in 2013 with the aim of providing individual counseling to all lower track students. In Freiburg, the program "Successful into Apprenticeship" ("Erfolgreich in Ausbildung") for the lower track has been running since the late 2000's. It involves additional classroom-based career guidance as well as group and individual counseling both provided by local educational providers (Fitzenberger and Lickleder, 2015).

The effect of counseling may differ by type of provider (here: employment agency vs. school counselors of local initiatives). They have different training backgrounds and slightly different perspectives on the school-to-work transition. Counselors of the employment agency are case workers with expertise on youth labor markets. School counselors are usually hired by local educational providers and allocated to schools, with typically one counselor per school. Most counselors are trained social workers. The employment agency focuses on the immediate transition into the labor market while school-based counseling may put a greater emphasis on the continuation of schooling as it might improve the students' future chances on the labor market.

Table 3.2 shows first descriptive evidence on the take-up of different types of career guidance by students in the middle and lower tracks of secondary school. Career guid-

Table 3.2: Take-up of Career Guidance Counseling Services by School Track

	Type of Secondary School lower track	middle track	sig
meeting school counselor	0.85	0.37	***
Av. number of counseling meetings	7.72	2.35	***
meeting employment agency	0.50	0.71	***
Av. number of counseling meetings	1.99	1.60	**
meeting teacher	0.34	0.21	***
Av. number of teacher meetings	4.42	1.92	***
counseling outside school	0.12	0.09	
multiple take-up of difference services			
meeting 1 counselor	0.28	0.48	***
meeting 2 counselors	0.38	0.24	***
meeting 3 counselors	0.22	0.14	*
meeting 4 counselors	0.01	–	

Notes: Stat. significant difference: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

ance by school-based counselors is used more intensively by students of the lower track.[6] Whereas 85 % of the students in the lower secondary school track have taken up the support of counselors at school, only 37 % of students in the middle track speak with a school counselor about career guidance, reflecting that the school-based counseling programs focus on the lower track. In addition, in the lower track students have more meetings (7.7 on average) with school counselors than in the middle track (2.4 on average). Hence, individual counseling of lower track students not only involves almost all students but is also quite intensive.

Counseling offered by the employment agency is the most commonly used type of career guidance for middle track students. 71 % of the students in the middle track and 50 % of those in the lower track have at least one meeting with a counselor of the employment agency. However, in the lower track this type of counseling is less intensive than the counseling by school counselors. For the middle track, our subsequent analysis focuses on counseling by the employment agency.

Teachers play only a minor role as advisers for career guidance as only 34 % of the lower track students and 21 % of the middle track students make use of such support. Students in the lower track on average meet 4.4 times with teachers, whereas students from the middle track have 2 meetings. The majority of the lower track students meets with two or more different counselors (school counselors, teachers, the employment agency etc.) while middle track students on average meet a counselor only once. Overall, students in the lower track thus receive significantly more career guidance than students in the middle track.

Table 3.3 shows the different types of support provided by teachers, school counselors, and the employment agency as well as evidence on students' satisfaction with the support both conditional upon meeting one of the counselors. The most important type of support is a discussion of career and education options. Lower track students also receive support by school counselors regarding applications (73 %) and information about vacant apprenticeships (54 %). The employment agency mostly offers information on career and education options for middle track students and on vacant apprenticeships for lower track students. Teachers also discuss career and education options with the majority of

[6] Students were told the names of the counselors working at their school so that they were able to refer to the right person.

students (80 %) and they provide application support for about half of the students in both tracks.

Table 3.3: Type of Support Provided by Career Guidance Counselors by School Track

	lower track	middle track	sig
School counselor			
Type of Support provided			
Discussion of career/ educational options	0.84	0.93	*
Support with applications	0.74	0.37	***
Information about vacant apprenticeships	0.54	0.44	
Matching of apprenticeships	0.40	0.31	
Support was helpful	0.80	0.80	
Employment agency			
Type of Support provided			
Discussion of career/ educational possibilities	0.68	0.86	***
Support with applications	0.28	0.20	
Information about vacant apprenticeships	0.54	0.32	***
Matching of apprenticeships	0.39	0.32	
Support was helpful	0.70	0.77	
Teacher			
Type of Support provided			
Discussion of career/ educational possibilities	0.79	0.79	
Support with applications	0.48	0.45	
Information about vacant apprenticeships	0.29	0.21	
Matching of apprenticeships	0.29	0.15	
Support was helpful	0.79	0.65	

Notes: Conditional on take up. Stat. significant difference: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

The majority of students considers counseling to be helpful. With 80 % satisfied students school counselors seem to be most helpful, but the employment agency is deemed helpful by 70 % of the students in the lower track and 78 % in the middle track. Support by teachers is considered somewhat less helpful by middle track students as well.

In what follows, we focus on counseling by the employment agency and by school counselors, because the take-up of career guidance by teachers is less common (Table 3.2) and difficult to separate from regular schooling. Our analysis of the take-up of counseling by school counselors and by the employment agency distinguishes between the incidence of take-up and the intensity of counseling (for school counselors/employment agency intensive use means at least three/two meetings).[7]

First, we consider the determinants of take-up in the lower school track. Table 3.4 reports the average marginal effects of probit regressions on the take-up probability. There are almost no significant individual determinants of lower track students' take-up of counseling at school or at the employment agency. We find no evidence for the need-hypothesis with regard to the incidence of take-up. However, looking at the intensity of take-up we find some evidence for the need-hypothesis: Lower track students from non-German speaking families are more likely to meet with school-based counselors more frequently. We do not find a comparable relationship for counseling by the employment agency.

As very few middle track students meet with school counselors, Table 3.5 focuses on meeting a counselor from the employment agency. Contrary to the lower track, middle

[7] Our results on the determinants of intensive use are robust, when we restrict the analysis to a sample including only students that had at least one meeting. These results are omitted here and available upon request.

Table 3.4: Determinants of Take-Up of Counseling by an Employment Agency or School Counselor – Lower Track (Marginal effects)

	School counselors				Employment agency			
	Take up		at least 3 meetings		Take up		at least 2 meetings	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Female	0.109**	0.035	-0.048	-0.202**	-0.051	-0.118	-0.023	-0.082
	(0.055)	(0.032)	(0.094)	(0.096)	(0.099)	(0.096)	(0.082)	(0.081)
9th Grade	-0.015	0.006	-0.190	-0.345***	-0.137	-0.145	-0.262***	-0.316***
	(0.075)	(0.038)	(0.127)	(0.123)	(0.113)	(0.121)	(0.075)	(0.061)
German spoken	-0.074	-0.057	-0.342**	-0.402***	-0.046	-0.015	0.066	0.099
in family	(0.078)	(0.035)	(0.140)	(0.122)	(0.116)	(0.127)	(0.086)	(0.099)
Parents college	0.007	-0.011	0.067	0.068	0.062	0.083	-0.155	-0.154
	(0.066)	(0.034)	(0.094)	(0.139)	(0.125)	(0.128)	(0.146)	(0.134)
Parents encourage	0.012	-0.003	-0.117	-0.126	-0.063	-0.059	-0.072	-0.079
effort in school	(0.054)	(0.035)	(0.086)	(0.082)	(0.097)	(0.099)	(0.068)	(0.068)
Parents proud of	0.049	0.018	0.266**	0.242**	0.058	0.049	0.160*	0.127
educ. achievement	(0.054)	(0.030)	(0.109)	(0.106)	(0.135)	(0.141)	(0.088)	(0.090)
Ambitious friends	-0.029	-0.035	0.093	-0.031	-0.035	-0.069	-0.023	-0.048
	(0.055)	(0.030)	(0.116)	(0.109)	(0.107)	(0.106)	(0.093)	(0.114)
Good Math grade	0.011	-0.009	-0.117	-0.246**	-0.086	-0.065	-0.010	-0.036
	(0.052)	(0.024)	(0.102)	(0.111)	(0.123)	(0.121)	(0.102)	(0.099)
Good German grade	0.015	0.020	-0.115	-0.088	-0.005	-0.047	-0.045	-0.045
	(0.069)	(0.039)	(0.092)	(0.101)	(0.128)	(0.126)	(0.061)	(0.064)
Openness	-0.053**	-0.029**	-0.012	0.002	0.031	0.033	0.004	0.002
	(0.022)	(0.012)	(0.036)	(0.043)	(0.040)	(0.039)	(0.027)	(0.024)
Extraversion	-0.007	0.001	0.079**	0.101**	-0.026	-0.016	0.004	0.008
	(0.024)	(0.016)	(0.038)	(0.043)	(0.041)	(0.038)	(0.033)	(0.035)
Conscientiousness	-0.012	-0.003	-0.013	-0.020	0.052	0.044	0.044	0.039
	(0.022)	(0.014)	(0.049)	(0.058)	(0.034)	(0.037)	(0.036)	(0.042)
Neuroticism	-0.006	-0.000	0.053	0.071	-0.047	-0.026	-0.050	-0.027
	(0.024)	(0.016)	(0.047)	(0.051)	(0.045)	(0.047)	(0.033)	(0.035)
Agreeableness	0.038	0.022	0.044	0.040	0.046	0.039	0.095**	0.077*
	(0.028)	(0.015)	(0.037)	(0.038)	(0.039)	(0.040)	(0.040)	(0.042)
external	0.029**	0.019***	0.022	0.009	0.066*	0.047	0.105***	0.077**
locus of control	(0.014)	(0.006)	(0.043)	(0.054)	(0.036)	(0.038)	(0.034)	(0.031)
internal	0.034	0.023	0.020	0.006	-0.022	-0.059	-0.068*	-0.105**
locus of control	(0.034)	(0.020)	(0.041)	(0.041)	(0.045)	(0.049)	(0.037)	(0.041)
Risk loving	0.011	0.006	0.005	-0.000	0.013	0.014	0.016	0.014
	(0.009)	(0.004)	(0.015)	(0.019)	(0.013)	(0.014)	(0.012)	(0.012)
School dummies		yes		yes		yes		yes
pseudo R^2	0.126	0.247	0.151	0.282	0.076	0.131	0.185	0.277
Observations	154	154	154	154	153	153	153	153

Notes: Marginal effects of probit estimations, controls for city and missing grades included.
Standard errors clustered by class in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

track students meeting employment agency counselors are slightly positively selected with regards to peers and non-cognitive skills. Hence, there is once again no support for the need-hypothesis in the incidence of counseling take-up. Only good math grades are negatively correlated with the intensity of take-up of counseling provided by the employment agency, and thus provides only very weak evidence for the need-hypothesis for the middle tracks students.

Table 3.5: Determinants of Take-Up of Counseling from the Employment Agency – Middle Track (Marginal effects)

	Employment agency			
	Take up		at least 2 meetings	
	(1)	(2)	(1)	(2)
Female	-0.096	-0.090	-0.007	0.024
	(0.066)	(0.062)	(0.062)	(0.043)
German spoken in family	0.129	0.055	-0.010	0.051
	(0.125)	(0.133)	(0.132)	(0.100)
Parents college	-0.058	-0.081	-0.102	-0.050
	(0.080)	(0.092)	(0.084)	(0.065)
Parents encourage effort in school	-0.114	-0.121	0.024	-0.007
	(0.088)	(0.086)	(0.052)	(0.045)
Parents proud of educ. achievement	0.115**	0.166***	0.061	0.074
	(0.057)	(0.060)	(0.078)	(0.058)
Ambitious friends	0.232**	0.298***	0.115*	0.135**
	(0.091)	(0.065)	(0.068)	(0.054)
Good Math grade	0.063	0.044	-0.113**	-0.060*
	(0.079)	(0.074)	(0.047)	(0.035)
Good German grade	0.123*	0.082	-0.069	-0.029
	(0.075)	(0.077)	(0.098)	(0.076)
Openness	0.034	0.077*	0.031	0.037
	(0.037)	(0.040)	(0.027)	(0.024)
Extraversion	-0.097***	-0.119***	-0.052	-0.049*
	(0.034)	(0.043)	(0.033)	(0.027)
Conscientiousness	-0.038	-0.030	0.011	0.001
	(0.029)	(0.035)	(0.032)	(0.029)
Neuroticism	0.007	-0.008	-0.025	-0.032
	(0.037)	(0.038)	(0.034)	(0.029)
Agreeableness	0.062	0.027	-0.061**	-0.039*
	(0.038)	(0.042)	(0.024)	(0.020)
external locus of control	0.006	-0.002	0.018	0.023
	(0.043)	(0.046)	(0.045)	(0.040)
internal locus of control	0.155***	0.180***	-0.004	0.003
	(0.054)	(0.049)	(0.051)	(0.043)
Risk loving	0.018	0.004	0.019	0.007
	(0.015)	(0.015)	(0.014)	(0.010)
School dummies		yes		yes
pseudo R^2	0.147	0.282	0.097	0.258
Observations	160	160	160	160

Notes: Marginal effects of probit estimations, controls for city included. Standard errors clustered by class in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Our findings on the take-up of counseling are robust when accounting for class and school fixed effects. The OLS regressions reported in Tables 3.A.2 and 3.A.3 in the Appendix provide very similar findings to the Probit regressions discussed above, even after accounting for class fixed effects. Further, the OLS regressions show that including school fixed effects or class fixed effects increases the explanatory power considerably, in particular for the intensity of counseling in the lower track. Thus, the school and the class setting are important determinants of the take-up and intensity, being even more relevant than personal characteristics. This is in line with the supply-hypothesis,

while our findings provide only weak evidence for the need-hypothesis. The differences regarding the relevance of the supply-hypothesis between school tracks fit the observed setting of strongly institutionalized career guidance at lower track schools and weaker institutions at middle track schools.

3.3.2 Work Experience Placements

As a second type of career guidance activity, we consider work experience placements in local firms. Most placements last about a week and workplaces are not predetermined by the school. They are key opportunities for secondary school students to acquire practical job experience in different occupations, and to present themselves to potential apprenticeship employers. In addition, there are also job visit days in firms ("Praxistage"), sometimes organized by sponsors and firms who partner with the school.

While job visit days are not used intensively in our sample (on average less than 2 days), work experience placements are much more relevant in career guidance (Table 3.6). On average, lower track students complete 3.5 placements with an average total duration of about 23 days (exceeding the state target of at least 20 days for the lower track (Schröder, 2015). Middle track students complete, on average, 2.1 placements with a total duration of 12 days. The differences are highly significant and sizeable, particularly in light of the fact that about two thirds of the lower track students are in 9^{th} grade (see Table 3.A.1) while all middle track students are in 10^{th} grade.

75 % of students find work experience placements by themselves, while the second most frequent channel involves family and relatives. However, with a share of 36.8 %, lower track students use this search channel significantly less than those in the middle track. This difference probably reflects social selection by track (see Table 3.A.1). Lower track students receive additional support from counselors and teachers when searching for work experience placements, while this is not the case for middle track students.

Table 3.6: Descriptive Statistics on Work Experience Placements by School Track

	Secondary School Track		sig
	lower track	middle track	
Number of "Job Visit Days"	1.83	1.75	
Number of work experience placements	3.52	2.08	***
Av. duration of work experience placement (days)	7.96	6.00	***
Total duration of work experience placements (days)	22.52	11.99	***
Search channels for work experience placements			
Student by him/herself	0.72	0.75	
School counselor	0.15	0.01	***
Teacher	0.10	0.03	***
Family/relatives	0.37	0.51	***
Work experience placement Quality			
Quality of supervision at work experience placement (scale 0-3)	1.56	1.75	***
Enjoyed work experience placement (scale 0-3)	1.43	1.57	**
work experience placement in desired occupation	0.43	0.37	**
Most enjoyed work experience placement in desired occupation	0.47	0.40	

Notes: Stat. significant difference * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Middle track students, on average, rated their work experience placements better than lower track students, both in regard to the quality of supervision during the placement and by how much they enjoyed it. Only a third of the students in the sample completed a work experience placement in their desired future occupation. The fit of the placements

to the students' interests might be an important channel for successful career planning, as students can adjust their expectations and preferences. Table 3.7 contrasts the sector shares among all actual placements, among placements rated best by each student, and among the desired occupations. Manufacturing and health have the highest share of desired occupations and many students have work experience placements in these sectors. However, some sectors (like trade and sales, social/care work, education) show a lot of placements, even though student interest is much lower. At the same time, there are other sectors (like public service/administration, information technology) that often fit the desired future occupation but only a few student complete placements in these sectors. The evidence in Table 3.7 reveals a mismatch between desired occupations and actual placements, suggesting that there is a need to inform students about the actual labor market opportunities and to help students form more realistic expectations (Goux et al., 2015). It could also point to the need to offer more diversified placements.

Table 3.7: Sector of Work Experience Placements, Best work experience placement and Desired Occupation

Sector	Work experience pl.	Best Work experience pl.	Desired occupation
Health	20.6%	21.4%	17.0%
Trade and sales	18.3%	17.9%	14.8%
Social/care work, education	17.0%	12.4%	11.2%
manufacturing/engineering	15.8%	16.9%	17.3%
Humanities	1.1%	1.4%	1.1%
Information technology	1.7%	1.7%	5.1%
Natural Sciences	1.3%	1.4%	2.9%
Skilled crafts and trades	4.1%	2.4%	2.2%
Construction	2.8%	3.4%	3.2%
Creative/Entertainment	5.0%	6.6%	5.8%
Food production/gastronomy	4.5%	5.2%	5.1%
Public service/administration	2.1%	3.8%	7.2%
Other Services	5.6%	5.5%	7.2%
Observations	753	290	277

Next, we analyze the determinants of both the quantity and the quality of work experience placements (Table 3.8 for lower track and 3.9 for middle track). We measure quantity here by a dummy indicating the completion of three or more work experience placements. The quality of work experience placements is measured by the dummy variable for a match between sector of placement and desired occupation.

Lower track students from non-German speaking families and of parents without college degrees are more likely to have completed three or more work experience placements. Thus, they seem to use these to compensate for missing labor market networks, which supports the need-hypothesis. If lower track students have met at least once with the employment agency they also have more placements, a higher frequency of counseling meetings however is not relevant. In contrast, a higher frequency of counseling meetings with the employment agency increases the probability of completing a work experience placement in the desired occupation. This might be the result of adjusted expectations or search assistance for a matching placement by the employment agency. There is no support for the need-hypothesis in the quality of the work experience placements. Rather, to the contrary, students with assistance from their family and relatives are more likely to find a matching placement. Female students are more likely to complete a matching placement. We cannot disentangle whether female students have adjusted their expectations earlier to the available options, or whether they got lucky because

more placements are offered in female-dominated sectors (see Table 3.7).

For middle tracks students, there is no evidence supporting the need-hypothesis for the quantity of work experience placements regarding family background and grades. On the contrary, more conscientious and agreeable students complete more placements. In terms of quality of the work experience placement, we again find no support for the need-hypothesis. Middle track students with parents with college degree are less likely to complete a placement in their desired occupation. This might possibly be due to higher occupational aspirations accordant to their parents' background. They are more likely to complete a matching placement when they searched by themselves, contrary to lower track students who needed assistance from their family.

Columns (2) and (4) in Tables 3.8 and 3.9 include school fixed effects. Schools might differ in the default number of placements students are expected to complete, in their network of cooperating firms offering placements, and the effort made to help students complete adequate placements.[8] The marginal effects of personal and family characteristics do not change much compared to columns (1) and (3).

The OLS regressions for work experience placements reported in Tables 3.A.4 and 3.A.5 in the Appendix provide very similar findings to the Probit regressions discussed above, even after accounting for class fixed effects. The quality of placements is affected by personal characteristics, and to some extent by counseling from the employment agency, whilst school and class fixed effects as well as school-based counseling do not matter. In accordance with the supply hypothesis, the OLS regressions for the quantity of placements also show that including school fixed effects or class fixed effects increases the explanatory power considerably, which is similar to the results for counseling. The increase is again particularly strong for lower track schools.

3.3.3 Class-level Variation of Take-up

The results thus far indicate that take-up of career guidance is strongly supply-driven, and individual level variables play only a minor role. When estimating the effect of the take-up of career guidance on career plans in the next section, one may be concerned about potential endogeneity due to unobserved student differences both affecting the take-up of career guidance and career planning. Therefore, we further investigate the variation in take-up of career guidance between classes. This variation may be driven by supply differences (Borghans et al., 2015), which are unrelated to career planning conditional on the covariates controlled for, or by learning based on the behavior of other students in the class. Factors driving supply differences may involve constraints in the work schedule of counselors, teacher attitudes towards career guidance or randomness in scheduling, time conflicts, and cancellations of career guidance activities. If one is willing to assume an exclusion restriction for career plans conditional on school-fixed effects, these differences between classes could be used as instrumental variables.

Our first approach follows Borghans et al. (2015) and uses average participation in career guidance at the class level as a driver of take-up. This variable is computed as the leave-one-out average of the share of students participating in the respective measure within the class of the student.[9] There is scope for this variable to be a good predictor of actual

[8] E.g. by reorganizing the school curriculum to provide enough time for placements during regular school weeks.

[9] If there are less than 5 observations per class those observations are added to the parallel classes of the same grade at the same school in order to lose fewer observations. Only, if there is no further class in the same grade, then the observations are dropped.

Table 3.8: Determinants of Quantity and Quality of Work Experience Placement (Lower Track)

	3 or more Work experience pl.		Work experience pl. in desired occup.	
Female	-0.187**	-0.121	0.309***	0.371***
	(0.075)	(0.086)	(0.086)	(0.097)
9th Grade	-0.228**	-0.328***	0.096	0.058
	(0.108)	(0.086)	(0.093)	(0.091)
German spoken in family	-0.235**	-0.320***	-0.115	-0.142
	(0.098)	(0.102)	(0.091)	(0.096)
Parents college	-0.293*	-0.312**	0.244	0.278
	(0.152)	(0.154)	(0.180)	(0.186)
Parents encourage effort in school	0.087	0.084	0.121	0.120
	(0.110)	(0.118)	(0.091)	(0.086)
Parents proud of educ. achievement	0.093	0.113	0.000	0.011
	(0.097)	(0.099)	(0.096)	(0.096)
Ambitious friends	-0.162	-0.119	-0.022	0.036
	(0.099)	(0.110)	(0.113)	(0.115)
Good Math grade	0.077	0.062	-0.012	-0.024
	(0.120)	(0.120)	(0.139)	(0.140)
Good German grade	0.064	0.122	0.115	0.132
	(0.086)	(0.083)	(0.110)	(0.111)
Openness	0.007	0.004	-0.053	-0.057
	(0.033)	(0.033)	(0.040)	(0.042)
Extraversion	-0.013	-0.012	0.013	0.019
	(0.039)	(0.045)	(0.032)	(0.032)
Conscientiousness	0.091***	0.093**	0.026	0.026
	(0.034)	(0.040)	(0.047)	(0.051)
Neuroticism	0.025	0.004	-0.037	-0.047
	(0.030)	(0.033)	(0.035)	(0.037)
Agreeableness	-0.046	-0.058	0.004	0.001
	(0.038)	(0.042)	(0.040)	(0.045)
external locus of control	-0.039	-0.048	-0.042	-0.043
	(0.039)	(0.047)	(0.051)	(0.052)
internal locus of control	-0.066	-0.022	-0.039	-0.022
	(0.056)	(0.059)	(0.053)	(0.056)
Risk loving	-0.007	-0.017	0.023	0.019
	(0.018)	(0.019)	(0.016)	(0.018)
Take-up employment agency	0.086	0.158**	-0.066	-0.064
	(0.098)	(0.077)	(0.133)	(0.146)
2 or more meetings employment agency	0.084	0.145	0.218*	0.250**
	(0.130)	(0.142)	(0.113)	(0.108)
Take-up school counselor	-0.020	-0.022	0.102	0.135
	(0.120)	(0.135)	(0.165)	(0.174)
3 or more meetings school counselor	0.044	0.047	0.063	0.061
	(0.081)	(0.091)	(0.115)	(0.118)
Own placement search			0.069	0.039
			(0.124)	(0.127)
Placement search family			0.221**	0.195**
			(0.105)	(0.097)
Placement search counselor			-0.039	-0.035
			(0.164)	(0.178)
School dummies		yes		yes
pseudo R^2	0.143	0.233	0.178	0.205
Observations	159	159	159	159

Notes: Marginal effects of probit estimations, controls for city and missing grades included. Standard errors clustered by class in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.9: Determinants of Quantity and Quality of Work Experience Placement (Middle Track)

	3 or more Work experience pl.		Work experience pl. in desired occup.	
Female	0.010	-0.027	0.111	0.114
	(0.079)	(0.082)	(0.091)	(0.091)
German spoken in family	0.069	0.051	-0.035	-0.066
	(0.131)	(0.126)	(0.156)	(0.177)
Parents college	0.058	0.022	-0.189**	-0.233**
	(0.060)	(0.059)	(0.096)	(0.091)
Parents encourage effort in school	-0.092	-0.059	-0.025	-0.051
	(0.065)	(0.068)	(0.092)	(0.096)
Parents proud of educ. achievement	-0.082	-0.084	0.148	0.170*
	(0.066)	(0.069)	(0.092)	(0.097)
Ambitious friends	-0.000	-0.022	0.055	0.086
	(0.104)	(0.101)	(0.083)	(0.089)
Good Math grade	0.004	0.007	-0.102	-0.099
	(0.064)	(0.063)	(0.095)	(0.096)
Good German grade	-0.017	0.003	-0.142	-0.202*
	(0.049)	(0.053)	(0.103)	(0.109)
Openness	-0.021	-0.020	-0.022	-0.025
	(0.020)	(0.020)	(0.037)	(0.038)
Extraversion	0.012	0.008	0.025	0.019
	(0.026)	(0.030)	(0.039)	(0.044)
Conscientiousness	0.065**	0.068**	-0.012	-0.017
	(0.028)	(0.028)	(0.048)	(0.050)
Neuroticism	0.032	0.049**	-0.003	-0.009
	(0.023)	(0.023)	(0.041)	(0.047)
Agreeableness	0.099***	0.097***	-0.005	-0.011
	(0.032)	(0.033)	(0.044)	(0.040)
external locus of control	0.038	0.022	-0.126***	-0.146***
	(0.040)	(0.043)	(0.042)	(0.039)
internal locus of control	-0.060	-0.060	0.041	0.032
	(0.047)	(0.047)	(0.073)	(0.072)
Risk loving	0.026*	0.026*	0.011	0.013
	(0.014)	(0.014)	(0.018)	(0.020)
Take-up employment agency	-0.122*	-0.148*	-0.011	-0.069
	(0.068)	(0.089)	(0.099)	(0.104)
2 or more meetings employment agency	0.117	0.155*	-0.072	-0.026
	(0.073)	(0.092)	(0.085)	(0.085)
Own placement search			0.199*	0.227**
			(0.104)	(0.106)
Placement search family			0.098	0.151
			(0.101)	(0.111)
School dummies		yes		yes
pseudo R^2	0.112	0.149	0.123	0.159
Observations	161	161	161	161

Notes: Marginal effects of probit estimations, controls for city included. Standard errors clustered by class in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

take-up because there is a lot of variation in take-up across classes which is not explained by our rich set of personal characteristics (similar to the variation across schools reported in Borghans et al. (2015)), see Tables 3.A.2 to 3.A.5 in the appendix. The same supply of career guidance may affect students within a class in the same direction, such that certain options may appear more salient than others, or there may be peer effects.

The leave-one-out class-level averages are good predictors of the individual take-up of counseling in all cases, except that significance is low for the quantity of counseling in the middle track (Table 3.A.12).[10] For the quantity of work experience placements the effect is only significant in the lower track - and no significant effect is found for the quality of placements.

Our second approach uses the within school variation across classes in take-up of career guidance activities. Recall that Tables 3.A.2 to 3.A.5 in the appendix involve stepwise first stage OLS regressions, where columns (1) involve personal characteristics, columns (2) add school fixed effects, and columns (3) add class fixed effects. As discussed above, adding class fixed effects strongly increases the explanatory power (measured by R^2), except for the quality of work experience placements. The partial increase in explanatory power due to the school fixed effects and the class fixed effects is stronger for the lower track, while still being sizeable for the middle track. Table 3.A.13 shows that the partial effect of class fixed effects (contrasting columns (2) and (3) in Tables 3.A.2 to 3.A.5) is highly significant in all cases.

Altogether, our further analysis confirms that there is a strong class-level component in all career guidance measures, except for the quality of work experience placements, conditional on school fixed effects. If one is willing to assume an exclusion restriction for career plans, these differences between classes conditional on school-fixed effects could be used as instruments. We will return to this point at the end of the next section.

3.4 The Effect of Career Guidance on Career Planning

In this section, we investigate whether career guidance activities improve the state of career planning among students. Our first measure of the advancement of career planning is the probability of reporting a desired occupation. For students who intend to apply for an apprenticeship, being able to state a desired occupation is a signal of improved career planning. Note that students in our sample do not report unrealistic "dream jobs" as their desired occupation. 75 % of the lower track and 58 % of the middle track students report a desired occupation that requires an apprenticeship. The students were asked separately which level of school qualification they think they can achieve and in the vast majority of cases the students' educational aspirations fit their desired occupations' required qualification (83 % of lower track and 85 % of middle track students). Thus, even though the high educational aspirations seem unrealistic on average, students appear to have a realistic view about the level of education needed to work in their desired occupation, indicating some realism in career planning.

Our second measure of career planning is the probability of having applied for an apprenticeship. A successful application typically requires a sufficient level of career planning. Additionally, applying for an apprenticeship shows that the students do not avoid making choices but actively make decisions for their future.

[10] Almost all lower track students have met at least once with school counselors. Hence, it is not surprising that the coefficient is lower for this case. Still it is highly significant.

Our third measure of career planning is whether students plan to continue general secondary education in the next school year. This usually implies reaching a higher secondary school qualification. A higher secondary school qualification might increase chances to find a more advanced apprenticeship position or even enter tertiary education. Thus planning an upgrading can serve as measure of advanced career planning because it implies knowledge of the apprenticeship labor market. However, it could also imply a lower level of career planning as students might opt to continue schooling to avoid the occupational choice and rather stick to something that they already know, i.e. school (Lavecchia et al., 2016).

Tables 3.10 and 3.11 report the average marginal effects of the probit regressions for the three measures of career planning: reporting a desired occupation, applying for apprenticeships and planning to continue school.

Lower track students meeting with a counselor from the employment agency are more likely to report a desired occupation and to have applied for an apprenticeship, and are less likely to continue schooling. The frequency of the meetings with the employment agency does not show significant effects. Students that met more often with school counselors are also more likely to report a desired occupation. There are no significant effects of school counselors on other career planning measures. Students with at least one work experience placement in their desired occupation are more likely to apply for apprenticeships, while a high number of placements is negatively associated with applying for an apprenticeship, possibly confusing the student's career planning. He/She might not be ready to apply for an apprenticeship, or perhaps finds it difficult to match his/her preferences with the apprenticeship positions available. Thus, advice by school counselors and adequate placements significantly affect career planning, though not in the same way at the extensive and the intensive margin. Specifically, the employment agency shapes students' career plan towards the labor market and away from continuing general schooling.

Table 3.11 presents the results for middle track students. Again, we find a positive relationship between career guidance measures and career planning for middle track students, however there are differences between school tracks. Middle track students that met with the employment agency are more likely to report a desired occupation. Students that had more than two meetings with the employment agency are more likely to have applied for apprenticeships. There is no effect of counseling from the employment agency on the plan to continue general schooling. Quantity and quality of work experience placements influences career planning in a very similar way. More than three placements results in a higher probability of having applied for an apprenticeship and a lower probability of planning to continue school. A placement in the desired occupation is highly relevant for career planning because such students are more likely to apply for apprenticeships and are less likely to plan to continue schooling.

There are some noteworthy covariate effects on plans to continue schooling, indicating that middle track students are positively selected. There is a positive effect of counseling on career planning regarding the probability of reporting a desired occupation, and of applying for apprenticeship, in both school tracks. However, we do not find stronger effects of school counselors than of employment agency counselors in the lower track. Counseling shows a slightly negative effect on plans to continue school. A work experience placement in the desired occupation increases the probability of applying for an apprenticeship.

The effect differences by school track can possibly be explained by the difference in the

Table 3.10: Probit Regression: Career Planning for Lower Track Students (Marginal Effects)

	reporting desired occupation	application apprenticeship	continue schooling
Take-up	0.165**	0.375***	-0.250*
employment agency	(0.077)	(0.088)	(0.130)
2 or more meetings	-0.157	-0.143	0.134
employment agency	(0.132)	(0.093)	(0.171)
Take-up	0.070	0.065	-0.169
school counselor	(0.154)	(0.092)	(0.208)
3 or more meetings	0.173*	0.095	0.135
school counselor	(0.092)	(0.098)	(0.158)
3 or more	0.043	-0.144*	0.040
Work experience pl.	(0.099)	(0.081)	(0.123)
Work experience pl. in		0.251***	-0.086
desired occupation		(0.072)	(0.094)
Female	0.148*	-0.046	0.003
	(0.080)	(0.091)	(0.094)
9th grade	0.193***	-0.320***	0.227**
	(0.058)	(0.074)	(0.114)
German spoken	0.019	0.209	0.030
in Family	(0.104)	(0.141)	(0.108)
Parents college	0.085	-0.007	-0.002
	(0.144)	(0.109)	(0.101)
Parents encourage	0.149*	-0.110	0.330***
effort in school	(0.086)	(0.092)	(0.086)
Parents proud of	-0.001	-0.032	0.095
educ. achievement	(0.097)	(0.103)	(0.145)
Ambitious friends	-0.076	-0.120	-0.068
	(0.059)	(0.084)	(0.098)
Good Math grade	-0.125	-0.133	0.368***
	(0.090)	(0.108)	(0.102)
Good German grade	-0.069	-0.077	0.208
	(0.105)	(0.089)	(0.147)
Openness	-0.092***	-0.014	0.036
	(0.033)	(0.038)	(0.054)
Extraversion	-0.017	0.027	-0.019
	(0.040)	(0.027)	(0.041)
Conscientiousness	0.035	0.051	0.051
	(0.031)	(0.038)	(0.040)
Neuroticism	-0.015	-0.037	0.076*
	(0.040)	(0.030)	(0.045)
Agreeableness	0.025	-0.070*	-0.062
	(0.037)	(0.036)	(0.057)
external	-0.007	0.070*	-0.002
locus of control	(0.032)	(0.039)	(0.037)
internal	-0.033	-0.042	0.104
locus of control	(0.038)	(0.050)	(0.084)
Risk loving	0.011	-0.022	0.020
	(0.012)	(0.018)	(0.018)
pseudo R^2	0.192	0.373	0.257
Observations	159	159	147

Notes: Marginal effects of Probit estimations, controls for city and missing grades included. Standard errors clustered by class in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.11: Probit Regression: Career Planning for Middle Track Students (Marginal Effects)

	reporting desired occupation	application apprenticeship	continue schooling
Take-up	0.272***	-0.022	-0.008
employment agency	(0.075)	(0.106)	(0.136)
2 or more meetings	0.050	0.254**	-0.005
employment agency	(0.089)	(0.111)	(0.150)
3 or more	0.006	0.181**	-0.199***
Work experience pl.	(0.089)	(0.082)	(0.076)
Work experience pl. in		0.182**	-0.310***
desired occupation		(0.081)	(0.094)
Female	0.176	-0.155*	0.054
	(0.122)	(0.080)	(0.122)
German spoken	-0.021	-0.312***	0.248*
in Family	(0.147)	(0.087)	(0.136)
Parents college	-0.000	-0.096	0.270**
	(0.058)	(0.113)	(0.128)
Parents encourage	0.059	0.114	-0.060
effort in school	(0.089)	(0.092)	(0.116)
Parents proud of	0.233**	0.067	-0.137
educ. achievement	(0.105)	(0.081)	(0.100)
Ambitious friends	-0.049	-0.122*	0.181**
	(0.058)	(0.071)	(0.088)
Good Math grade	-0.093	-0.126	0.236**
	(0.089)	(0.087)	(0.096)
Good German grade	-0.144	-0.235**	0.250**
	(0.103)	(0.092)	(0.119)
Openness	-0.053*	-0.000	-0.038
	(0.030)	(0.039)	(0.046)
Extraversion	0.084**	-0.030	0.019
	(0.039)	(0.028)	(0.034)
Conscientiousness	-0.051*	0.021	0.004
	(0.028)	(0.040)	(0.050)
Neuroticism	-0.107***	-0.021	0.049
	(0.029)	(0.053)	(0.062)
Agreeableness	-0.077	0.179***	-0.090
	(0.050)	(0.047)	(0.063)
external	-0.095***	0.029	-0.020
locus of control	(0.033)	(0.035)	(0.045)
internal	0.106*	-0.040	0.029
locus of control	(0.056)	(0.055)	(0.080)
Risk loving	-0.017	0.046***	0.000
	(0.014)	(0.017)	(0.023)
pseudo R^2	0.201	0.316	0.287
Observations	159	161	153

Notes: Marginal effects of Probit estimations, controls for city included. Standard errors clustered by class in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

stage of career planning. Middle track students are confronted by the decision to pursue a higher education entrance qualification (if they continue schooling) or the traditional path of starting an apprenticeship. These two options might be clear-cut, and thus career guidance can be more effective by focusing on these two choices. Lower track students are realistically expected to aspire to an apprenticeship, but need to decide whether upgrading their lower track secondary school qualification to a middle track secondary school qualification is beneficial (in order to improve their chances in the apprenticeship labor market). While this is likely to increase the need for career guidance, counseling also has to address various individual barriers to investing in learning and to decision making. Thus, the challenge for school counselors in lower secondary schools is very high, which may explain the lack of significantly positive effects on career planning.

Our results are robust to different specifications of the estimation models as the step-wise addition of control variables and school dummies in Tables 3.A.6 to 3.A.11 shows.

Finally, we provide a short discussion regarding concerns about possible selection in the take-up of career guidance. Based on a priori reasoning, there may be positive or negative selection. On the one hand, students meeting with the employment agency or school counselors may be more motivated, or they may have concrete plans to enter the labor market. In that case, career planning may be more advanced independently of career guidance. On the other hand, students whose state of career planning is less advanced may seek more career guidance or are advised to do so. Hence, the direction of possible bias is not clear.

For two reasons, however, we think that selection in the take-up of counseling and of the quantity of work experience placements is not a major issue for our results. First, our findings in Section 3.3 provide strong evidence for the supply hypothesis, and for peer effects. At the same time, personal characteristics as drivers of selection on observables play only a minor role. Thus, we consider it unlikely that selection on unobservables is strong. Second, if one is willing to assume an exclusion restriction for class-level drivers of take-up conditional on school-fixed effects, and implements an instrumental variable (IV) approach, the first stage is mostly satisfactory, however the point estimates are very noisy and are not satisfactory. The point estimates typically show the same sign, are mostly larger, and most likely overestimate the effect size.[11] Still, they do not differ significantly from the OLS estimates.

3.5 Conclusions

This paper analyzes the take-up of career counseling and work experience placements as well as their effects on career planning, based on a survey we conducted in lower and middle track secondary schools in Germany. We distinguish between incidence and quantity of counseling and between quantity and quality of work experience placements.

Career guidance is offered more intensively to students in the lower track than in the middle track, reflecting that career planning is a more pressing issue for lower track students. A key finding is that the incidence of take-up of counseling provided by the employment agency or the school counselor is barely related to individual characteristics, including parental background or grades. Noteworthy exceptions are: lower track students from non-German speaking families are more likely to meet with school counselors frequently

[11] Because of these issues we omit the detailed IV results here but they are available upon request.

and complete three or more work experience placements, and in the middle track low-performing students are more likely to use intensive counseling from the employment agency. Overall, there is only limited evidence that students facing greater difficulties in career planning are more engaged in career guidance. Rather, there are strong differences in take-up of career guidance across schools and classes which are unrelated to the individual characteristics of the students. As a quality measure of work experience placements, we use whether or not students complete a work experience placement in their desired occupation. In contrast to the other activities, this quality indicator is much less affected by school and class effects, and also depends very little on individual characteristics. One noteworthy exception: in the middle track, frequent counseling by the employment agency and own search effort shows a positive effect on the quality of placements, which suggests a positive selection of students with high quality placements.

The second part of our study estimates the effect of career guidance on the state of career planning, measured by whether students report a desired occupation, have applied for apprenticeships, and plan to continue schooling. Our findings show that a higher number of work experience placements improve career planning only in the middle track, where students with at least three work experience placements are more likely to have applied for an apprenticeship. For lower track students, there is an opposite effect. Placements in the preferred occupation are associated with better career planning in both school tracks, a finding which we do not interpret as causal. Furthermore, a higher number of placements show a negative effect on the probability of continuing schooling for middle track students, which is consistent with placements making an apprenticeship more attractive relative to the continuation of schooling. However, the number of placements does not show such an effect for lower track students, i.e. the policy implications of our findings are ambiguous in light of the focus of career guidance on the number of placements. Possibly, lower track students are less ready to apply for an apprenticeship and more placements cannot change that. Schools and counselors are not successful in improving the quality of placements, which rather depends on the students' own search activities or their family's support.

For lower track students, frequent counseling provided by school counselors increases the probability of reporting a desired occupation, while counseling provided by the employment agency increases the probability of applying for apprenticeships and of reporting a desired occupation but reduces the probability of planning to continue schooling. Frequent school counseling does not affect the other types of career planning. Middle track students meeting with an employment agency counselor have a higher probability of reporting a desired occupation and frequent meetings increase the probability of applying for an apprenticeship. In sum, the employment agency seems more effective than school counseling in supporting career planning aimed at entering the labor market through an apprenticeship. The employment agency seems to attenuate high educational aspirations, similar to the treatment considered in Goux et al. (2015) for the case of France.

Altogether, our findings suggest that career guidance can improve secondary school students' career planning. However, the impact differs by school track and type of counseling provider. Clearly, further research on the effects of career guidance is needed, especially in light of the current policy initiatives to expand career guidance in upper secondary schools in Germany (see Bundesagentur für Arbeit, 2018).

3.A Appendix

Table 3.A.1: Descriptive Statistics of the Sample by School Track

	Secondary School Track		sig
	lower track	middle track	
Female	0.54	0.45	*
City (=Mannheim)	0.56	0.43	**
9th grade	0.68	–	
German spoken in family	0.81	0.94	***
At least one parent with college degree	0.11	0.34	***
Parents encourage effort in school	0.65	0.63	
Parents are proud of educational achievement	0.69	0.65	
Ambitious friends: Many friends strive for upgrading	0.26	0.69	***
Good or excellent grade in Math	0.19	0.39	***
Good or excellent grade in German	0.31	0.32	
Grades variable missing	0.08	0.02	**
College degree is achievable	0.25	0.46	***
Higher education entrance qualification is achievable	0.22	0.42	***
Personality Traits (Big Five, scale 1-7)			
Conscientiousness	4.8	4.85	
Extraversion	4.66	4.88	
Agreeableness	5.11	5.39	**
Neuroticism	4.18	4.06	
Openness to new experiences	4.6	4.9	**
Locus of Control (scale 1-7)			
External LOC	3.28	3.17	
Internal LOC	5.92	5.83	
Risk aversion (risk averse 0-10 risk loving)	6.31	6.37	
Application for apprenticeship	0.3	0.34	
Continue schooling (upgrading qualification)	0.49	0.59	*
Reporting desired occupation	0.7	0.67	
Observations	159	161	

Notes: Stat. significant difference * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.A.2: Robustness Check: OLS Regression Take-up of Counseling including Class/School Dummies – Lower Track

	School counselors at least 3 meetings			Take up			Employment agency at least 2 meetings		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Female	-0.037	-0.116	-0.028	-0.042	-0.099	-0.089	-0.025	-0.086	-0.080
	(0.089)	(0.081)	(0.063)	(0.098)	(0.088)	(0.098)	(0.081)	(0.073)	(0.084)
9th Grade	-0.154	-0.260***	-0.006	-0.128	-0.114	-0.032	-0.241**	-0.277***	-0.221**
	(0.114)	(0.091)	(0.205)	(0.113)	(0.118)	(0.107)	(0.099)	(0.074)	(0.084)
German spoken	-0.271**	-0.257**	-0.285***	-0.050	-0.007	-0.046	0.044	0.090	-0.013
in family	(0.117)	(0.093)	(0.090)	(0.115)	(0.126)	(0.133)	(0.081)	(0.099)	(0.096)
Parents college	0.062	0.048	0.075	0.059	0.074	0.048	-0.121	-0.116	-0.138
	(0.073)	(0.092)	(0.089)	(0.128)	(0.132)	(0.126)	(0.121)	(0.115)	(0.128)
Parents encourage	-0.088	-0.099	-0.080	-0.062	-0.039	-0.006	-0.071	-0.061	-0.056
effort in school	(0.082)	(0.072)	(0.078)	(0.096)	(0.094)	(0.117)	(0.075)	(0.075)	(0.084)
Parents proud of	0.211**	0.137	0.180**	0.054	0.053	0.080	0.133	0.111	0.103
educ. achievement	(0.099)	(0.092)	(0.077)	(0.138)	(0.139)	(0.150)	(0.091)	(0.090)	(0.095)
Ambitious friends	0.076	-0.010	0.081	-0.023	-0.042	0.006	-0.011	-0.051	-0.066
	(0.103)	(0.079)	(0.076)	(0.101)	(0.097)	(0.097)	(0.104)	(0.116)	(0.114)
Good Math grade	-0.087	-0.135	-0.113	-0.087	-0.076	-0.137	-0.029	-0.042	-0.056
	(0.099)	(0.096)	(0.093)	(0.124)	(0.120)	(0.146)	(0.085)	(0.072)	(0.075)
Good German grade	-0.094	-0.078	-0.105	-0.005	-0.033	-0.032	-0.043	-0.051	-0.105
	(0.085)	(0.083)	(0.092)	(0.128)	(0.120)	(0.136)	(0.068)	(0.066)	(0.074)
School dummies		yes			yes			yes	
Class dummies			yes			yes			yes
Constant	-0.026	0.486	0.648	0.289	0.271	0.564	0.040	0.196	0.585
	(0.305)	(0.427)	(0.407)	(0.469)	(0.408)	(0.429)	(0.446)	(0.340)	(0.347)
R^2	0.184	0.340	0.464	0.100	0.184	0.325	0.171	0.264	0.425
Adjusted R^2	0.069	0.217	0.305	-0.029	0.031	0.115	0.052	0.126	0.247
Observations	154	154	154	153	153	153	153	153	153

Notes: Same model specification with covariates as in Table 3.4. Standard errors clustered by class in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.A.3: Robustness Check: OLS Regression Take-up of Counseling including Class/School Dummies – Middle Track

	Employment agency					
	Take up			at least 2 meetings		
	(1)	(2)	(3)	(1)	(2)	(3)
Female	-0.086	-0.103	-0.067	-0.017	-0.005	-0.013
	(0.065)	(0.062)	(0.069)	(0.064)	(0.063)	(0.069)
German spoken in family	0.124	0.107	0.010	-0.028	0.066	0.011
	(0.144)	(0.174)	(0.166)	(0.147)	(0.147)	(0.153)
Parents college	-0.052	-0.059	-0.045	-0.078	-0.061	-0.061
	(0.079)	(0.080)	(0.088)	(0.083)	(0.080)	(0.089)
Parents encourage effort in school	-0.109	-0.132	-0.121	0.030	0.004	0.002
	(0.083)	(0.087)	(0.096)	(0.055)	(0.059)	(0.071)
Parents proud of educ. achievement	0.099	0.104*	0.072	0.064	0.083	0.056
	(0.059)	(0.060)	(0.051)	(0.082)	(0.071)	(0.080)
Ambitious friends	0.217**	0.214**	0.209**	0.115	0.147*	0.165*
	(0.088)	(0.081)	(0.085)	(0.072)	(0.071)	(0.088)
Good Math grade	0.068	0.060	0.050	-0.101**	-0.057	-0.073
	(0.075)	(0.064)	(0.066)	(0.048)	(0.046)	(0.054)
Good German grade	0.093	0.087	0.108	-0.045	-0.008	0.036
	(0.074)	(0.077)	(0.081)	(0.109)	(0.085)	(0.089)
School dummies		yes			yes	
Class dummies			yes			yes
Constant	-0.402	-0.461	-0.573	0.544	0.187	0.063
	(0.497)	(0.549)	(0.571)	(0.480)	(0.455)	(0.488)
R^2	0.164	0.196	0.275	0.096	0.235	0.278
Adjusted R^2	0.064	0.060	0.085	-0.012	0.106	0.088
Observations	160	160	160	160	160	160

Notes: Same model specification with covariates as in Table 3.5. Standard errors clustered by class in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.A.4: Robustness Check: OLS Regression Participation in Work Experience Placements including Class/School Dummies – Lower Track

	3 or more Work experience pl.			Work exp. pl. in desired occup.		
	(1)	(2)	(3)	(1)	(2)	(3)
Female	-0.162**	-0.081	-0.072	0.248***	0.285***	0.279***
	(0.067)	(0.076)	(0.089)	(0.075)	(0.080)	(0.098)
9th Grade	-0.200*	-0.255***	-0.173	0.079	0.042	0.216
	(0.099)	(0.073)	(0.134)	(0.082)	(0.081)	(0.151)
German spoken in family	-0.167*	-0.201**	-0.161*	-0.100	-0.115	-0.053
	(0.085)	(0.091)	(0.092)	(0.092)	(0.094)	(0.101)
Parents college	-0.273*	-0.268*	-0.288*	0.216	0.227	0.285
	(0.155)	(0.153)	(0.156)	(0.171)	(0.180)	(0.204)
Parents encourage effort in school	0.073	0.066	0.047	0.096	0.096	0.110
	(0.105)	(0.108)	(0.114)	(0.084)	(0.080)	(0.084)
Parents proud of educ. achievement	0.070	0.075	0.033	-0.017	-0.007	0.005
	(0.094)	(0.089)	(0.092)	(0.083)	(0.083)	(0.093)
Ambitious friends	-0.131	-0.079	-0.159	-0.028	0.012	-0.059
	(0.098)	(0.101)	(0.118)	(0.107)	(0.111)	(0.131)
Good Math grade	0.059	0.042	-0.013	-0.005	-0.008	-0.045
	(0.111)	(0.103)	(0.125)	(0.123)	(0.121)	(0.166)
Good German grade	0.059	0.089	0.138	0.092	0.100	0.163
	(0.085)	(0.081)	(0.088)	(0.094)	(0.095)	(0.100)
Take-up employment agency	0.083	0.129*	0.205**	-0.069	-0.060	-0.092
	(0.094)	(0.067)	(0.079)	(0.122)	(0.137)	(0.150)
2 or more meetings employment agency	0.064	0.108	0.008	0.195*	0.210*	0.314**
	(0.124)	(0.123)	(0.146)	(0.108)	(0.108)	(0.148)
Take-up school counselor	-0.021	-0.029	-0.009	0.089	0.111	0.076
	(0.125)	(0.135)	(0.153)	(0.148)	(0.158)	(0.178)
3 or more meetings school counselor	0.031	0.034	-0.017	0.054	0.058	0.092
	(0.073)	(0.083)	(0.092)	(0.106)	(0.110)	(0.169)
Own placement search				0.065	0.039	0.115
				(0.116)	(0.122)	(0.158)
Placement search family				0.188*	0.161*	0.105
				(0.092)	(0.086)	(0.101)
Placement search counselor				-0.030	-0.030	0.021
				(0.151)	(0.165)	(0.186)
School dummies		yes			yes	
Class dummies			yes			yes
Constant	1.201***	1.102***	1.179**	0.233	0.212	-0.239
	(0.362)	(0.360)	(0.424)	(0.382)	(0.383)	(0.426)
R^2	0.169	0.262	0.340	0.216	0.242	0.295
Adjusted R^2	0.028	0.109	0.116	0.061	0.065	0.032
Observations	159	159	159	159	159	159

Notes: Same model specification with covariates as in Table 3.8. Standard errors clustered by class in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.A.5: Robustness Check: OLS Regression Participation in Work Experience Placements including Class/School Dummies – Middle Track

	3 or more Work experience pl.			Work exp. pl. in desired occup.		
	(1)	(2)	(3)	(1)	(2)	(3)
Female	0.027	-0.003	0.012	0.107	0.104	0.088
	(0.073)	(0.075)	(0.077)	(0.085)	(0.083)	(0.082)
German spoken in family	0.060	0.041	-0.013	-0.038	-0.076	-0.136
	(0.129)	(0.119)	(0.127)	(0.154)	(0.174)	(0.211)
Parents college	0.045	0.015	0.023	-0.168*	-0.196**	-0.204**
	(0.068)	(0.069)	(0.064)	(0.094)	(0.090)	(0.088)
Parents encourage effort in school	-0.092	-0.062	-0.019	-0.009	-0.025	-0.080
	(0.067)	(0.073)	(0.054)	(0.086)	(0.093)	(0.096)
Parents proud of educ. achievement	-0.080	-0.079	-0.090	0.125	0.133	0.098
	(0.070)	(0.070)	(0.069)	(0.091)	(0.089)	(0.105)
Ambitious friends	-0.023	-0.056	-0.027	0.053	0.071	0.109
	(0.106)	(0.105)	(0.108)	(0.085)	(0.092)	(0.107)
Good Math grade	-0.006	-0.009	-0.041	-0.086	-0.080	-0.066
	(0.066)	(0.064)	(0.080)	(0.088)	(0.091)	(0.093)
Good German grade	-0.017	-0.002	-0.027	-0.143	-0.187*	-0.185
	(0.049)	(0.055)	(0.069)	(0.099)	(0.103)	(0.108)
Take-up employment agency	-0.094	-0.106	-0.142*	-0.014	-0.060	-0.061
	(0.074)	(0.084)	(0.077)	(0.097)	(0.095)	(0.099)
2 or more meetings employment agency	0.101	0.123	0.193*	-0.075	-0.032	-0.044
	(0.079)	(0.086)	(0.107)	(0.085)	(0.082)	(0.089)
Own placement search				0.178*	0.197*	0.199*
				(0.098)	(0.102)	(0.107)
Placement search family				0.086	0.122	0.158
				(0.098)	(0.106)	(0.106)
School dummies		yes			yes	
Class dummies			yes			yes
Constant	-0.377	-0.278	-0.196	0.426	0.695	0.389
	(0.418)	(0.490)	(0.499)	(0.394)	(0.423)	(0.479)
R^2	0.108	0.148	0.310	0.150	0.191	0.259
Adjusted R^2	-0.012	-0.010	0.116	0.022	0.026	0.036
Observations	161	161	161	161	161	161

Notes: Same model specification with covariates as in Table 3.9. Standard errors clustered by class in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.A.6: Robustness Check: Stepwise Probit Regression Effect of Career Guidance on Reporting a Desired Occupation – Lower Track (Marginal Effects)

	(1)	(2)	(3)	(4)	(5)	(6)
Take-up employment agency	0.107*	0.107*	0.138*	0.147*	0.166**	0.192***
	(0.065)	(0.065)	(0.072)	(0.080)	(0.077)	(0.075)
2 or more meetings employment agency	-0.125	-0.124	-0.122	-0.125	-0.162	-0.119
	(0.128)	(0.128)	(0.146)	(0.141)	(0.136)	(0.127)
Take-up school counselor	0.121	0.120	0.032	0.073	0.058	0.001
	(0.133)	(0.131)	(0.144)	(0.142)	(0.157)	(0.153)
3 or more meetings school counselor	0.095	0.095	0.172**	0.143*	0.185**	0.188*
	(0.082)	(0.081)	(0.082)	(0.085)	(0.092)	(0.107)
3 or more Work experience pl.		-0.007	0.021	0.035	0.037	0.028
		(0.081)	(0.096)	(0.099)	(0.100)	(0.113)
Gender, family background, peers			yes	yes	yes	yes
Grades				yes	yes	yes
Personality traits					yes	yes
School dummies						yes
Pseudo R^2	0.034	0.034	0.108	0.134	0.190	0.227
Observations	159	159	159	159	159	159

Notes: Marginal effects of Probit estimations, same model specification with covariates as in Table 3.10. Standard errors clustered by class in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.A.7: Robustness Check: Stepwise Probit Regression Effect of Career Guidance on Applying for Apprenticeship – Lower Track (Marginal Effects)

	(1)	(2)	(3)	(4)	(5)	(6)
Take-up employment agency	0.284***	0.316***	0.366***	0.376***	0.398***	0.403***
	(0.084)	(0.082)	(0.066)	(0.066)	(0.084)	(0.090)
2 or more meetings employment agency	-0.004	-0.030	-0.135	-0.141	-0.183*	-0.145
	(0.132)	(0.131)	(0.114)	(0.112)	(0.106)	(0.100)
Take-up school counselor	-0.051	-0.067	-0.026	-0.000	0.044	0.045
	(0.075)	(0.083)	(0.092)	(0.090)	(0.106)	(0.102)
3 or more meetings school counselor	0.158	0.166	0.161	0.131	0.144	0.088
	(0.108)	(0.113)	(0.104)	(0.102)	(0.096)	(0.106)
3 or more Work experience pl.		-0.121	-0.149**	-0.127*	-0.176**	-0.142*
		(0.080)	(0.069)	(0.073)	(0.074)	(0.077)
Work experience pl.		0.189***	0.247***	0.233***	0.278***	0.245***
in desired occupation		(0.071)	(0.065)	(0.063)	(0.070)	(0.076)
Gender, family background, peers			yes	yes	yes	yes
Grades				yes	yes	yes
Personality traits					yes	yes
School dummies						yes
Pseudo R^2	0.106	0.144	0.254	0.280	0.347	0.372
Observations	159	159	159	159	159	159

Notes: Marginal effects of Probit estimations, same model specification with covariates as in Table 3.10. Standard errors clustered by class in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.A.8: Robustness Check: Stepwise Probit Regression Effect of Career Guidance on Continue Schooling – Lower Track (Marginal Effects)

	(1)	(2)	(3)	(4)	(5)	(6)
Take-up employment agency	-0.181**	-0.197**	-0.214**	-0.210*	-0.250*	-0.286*
	(0.088)	(0.091)	(0.096)	(0.121)	(0.131)	(0.153)
2 or more meetings employment agency	0.006	0.008	0.050	0.074	0.134	0.150
	(0.153)	(0.161)	(0.163)	(0.164)	(0.172)	(0.190)
Take-up school counselor	-0.014	-0.005	-0.048	-0.125	-0.167	-0.153
	(0.129)	(0.142)	(0.159)	(0.174)	(0.212)	(0.190)
3 or more meetings school counselor	0.036	0.031	0.052	0.150	0.132	0.132
	(0.129)	(0.132)	(0.145)	(0.155)	(0.159)	(0.142)
3 or more work experience pl.		0.108	0.086	0.045	0.041	0.022
		(0.109)	(0.117)	(0.126)	(0.123)	(0.136)
work experience pl. in desired occupation		-0.061	-0.097	-0.102	-0.089	-0.105
		(0.073)	(0.087)	(0.087)	(0.097)	(0.120)
Gender, family background, peers			yes	yes	yes	yes
Grades				yes	yes	yes
Personality traits					yes	yes
School dummies						yes
Pseudo R^2	0.022	0.031	0.125	0.199	0.256	0.310
Observations	147	147	147	147	147	147

Notes: Marginal effects of Probit estimations, same model specification with covariates as in Table 3.10. Standard errors clustered by class in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.A.9: Robustness Check: Stepwise Probit Regression Effect of Career Guidance on Reporting a Desired Occupation – Middle Track (Marginal Effects)

	(1)	(2)	(3)	(4)	(5)	(6)
Take-up employment agency	0.156**	0.152**	0.145*	0.153**	0.273***	0.262***
	(0.074)	(0.075)	(0.075)	(0.075)	(0.079)	(0.073)
2 or more meetings employment agency	0.041	0.044	0.043	0.034	0.052	0.058
	(0.091)	(0.092)	(0.091)	(0.099)	(0.090)	(0.096)
3 or more work experience pl.		-0.049	-0.032	-0.037	0.007	0.044
		(0.068)	(0.072)	(0.076)	(0.089)	(0.100)
Gender, family background, peers			yes	yes	yes	yes
Grades				yes	yes	yes
Personality traits					yes	yes
School dummies						yes
Pseudo R^2	0.022	0.024	0.058	0.060	0.201	0.242
Observations	159	159	159	159	159	159

Notes: Marginal effects of Probit estimations, same model specification with covariates as in Table 3.11. Standard errors clustered by class in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.A.10: Robustness Check: Stepwise Probit Regression Effect of Career Guidance on Applying for Apprenticeship – Middle Track (Marginal Effects)

	(1)	(2)	(3)	(4)	(5)	(6)
Take-up employment agency	-0.088	-0.069	-0.023	0.009	-0.035	-0.012
	(0.107)	(0.113)	(0.103)	(0.107)	(0.113)	(0.083)
2 or more meetings employment agency	0.237**	0.256**	0.233**	0.210*	0.261**	0.252**
	(0.100)	(0.102)	(0.105)	(0.113)	(0.116)	(0.113)
3 or more work experience pl.		0.164***	0.228***	0.228***	0.166**	0.229***
		(0.061)	(0.064)	(0.065)	(0.081)	(0.069)
work experience pl. in desired occupation		0.217***	0.188***	0.167**	0.160**	0.146*
		(0.071)	(0.065)	(0.070)	(0.080)	(0.075)
Gender, family background, peers			yes	yes	yes	yes
Grades				yes	yes	yes
Personality traits					yes	yes
School dummies						yes
Pseudo R^2	0.031	0.090	0.167	0.220	0.303	0.399
Observations	161	161	161	161	161	161

Notes: Marginal effects of Probit estimations, same model specification with covariates as in Table 3.11. Standard errors clustered by class in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.A.11: Robustness Check: Stepwise Probit Regression Effect of Career Guidance on Continue Schooling – Middle Track (Marginal Effects)

	(1)	(2)	(3)	(4)	(5)	(6)
Take-up employment agency	0.090	0.059	0.020	-0.021	-0.002	0.073
	(0.117)	(0.125)	(0.115)	(0.126)	(0.138)	(0.130)
2 or more meetings employment agency	-0.064	-0.083	-0.061	-0.002	-0.012	-0.182
	(0.114)	(0.124)	(0.141)	(0.158)	(0.149)	(0.161)
3 or more work experience pl.		-0.174*	-0.224**	-0.212**	-0.194***	-0.178**
		(0.098)	(0.092)	(0.090)	(0.073)	(0.088)
work experience pl. in desired occupation		-0.349***	-0.322***	-0.295***	-0.299***	-0.311***
		(0.080)	(0.081)	(0.089)	(0.096)	(0.088)
Gender, family background, peers			yes	yes	yes	yes
Grades				yes	yes	yes
Personality traits					yes	yes
School dummies						yes
Pseudo R^2	0.005	0.108	0.205	0.267	0.284	0.372
Observations	153	153	153	153	153	153

Notes: Marginal effects of Probit estimations, same model specification with covariates as in Table 3.11. Standard errors clustered by class in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.A.12: Robustness Check: First Stage Probit Regression – Counseling instrumented by Class Averages of Participation (Marginal Effects)

	Employment Agency		school counselors		3 or more	work. exp. pl.
	Take up	2 or more times	Take up	3 or more times	work exp. pl.	desired occ.
Lower Track						
IV: class average in participation	0.576*** (0.216)	0.626*** (0.194)	0.375*** (0.071)	0.938*** (0.191)	0.468*** (0.147)	-0.475 (0.439)
Observations	154	154	154	154	154	154
Middle Track						
IV: class average in participation	0.538*** (0.179)	0.332* (0.177)			0.171 (0.258)	-0.283 (0.332)
Observations	161	161			161	161

Notes: Marginal effects of Probit estimations. Controlled for gender, city, 9th grade, parents' background and support, friends, grades, grades missing, personality traits. Standard errors clustered by class in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.A.13: Robustness Check: Joint Significance of Class Dummies in Estimations of Career Guidance Participation

	Employment agency		School counselor		3 or more	work exp. pl.
	Take up	2 or more	Take up	3 or more	work exp. pl.	desired occ.
Lower Track						
p-value	0.00	0.00	0.00	0.00	0.00	0.00
Observations	159	159	159	159	159	159
Middle Track						
p-value	0.00	0.00			0.00	0.00
Observations	161	161	161	161	161	161

Notes: H_0: Coefficients are 0. Based on OLS estimations. Additionally controlled for gender, city, 9th grade, parents' background and support, friends, grades, grades missing, personality traits, school dummies.

4 When the More Is Not the Merrier – Additional Career Assistance in Lower Track Secondary School and Medium-Term Labor Market Outcomes *

4.1 Introduction

Generally the German vocational training market has become less tight during the last decade (BMBF, 2018; Bonin, Fitzenberger, et al., 2016) and Germany has been a role model with regard to youth unemployment and labor market integration of youth (OECD, 2014). But there are still school leavers who have difficulties finding a vocational training position. This is in particular true for lower track secondary school students[1] who are at the lower end of the skill distribution of the applicants' pool. Only a minority of former lower track students transition into vocational training[2] directly after graduating with a lower track secondary school qualification (Gaupp et al., 2008; Menze and Holtmann, 2019). Either due to a lack of alternatives or by choice to improve their vocational training market position, many lower track students continue general schooling or participate in programs at vocational schools after 9^{th} grade. There they can upgrade their secondary schooling qualification and/or acquire vocational skills.

One possible reason for the difficult school-to-work transition might be a lack of career planning and ability to make career decisions of lower track students. They are relatively young when making far reaching decisions under uncertainty and imperfect information (DellaVigna, 2009; Golsteyn et al., 2014; Goux et al., 2015; Koch et al., 2015; Lavecchia et al., 2016). In Germany, career guidance programs have been intensified, particularly for lower track students, to support career planning both with regard to the educational and occupational decision (Schröder, 2015). Key players are the employment agency providing information and counseling and schools offering occupational orientation curriculum, work experience placements, and application support. There exist many additional career assistance activities by a variety of players, many of them initiated on the local level. This paper provides evidence on the medium-term labor market effects of a local program providing additional career assistance (ACA) for lower track secondary school students using a quasi-experimental approach. We show

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[1] In our setting, the lower track secondary school is 'Werkrealschule', the successor of the former 'Hauptschule'. Lower track students traditionally finish general schooling after 9^{th} or 10^{th} grade, transitioning into vocational training.

[2] Vocational training includes both firm-based apprenticeships with part-time schooling at vocational schools and full-time school-based vocational trainings at vocational schools.

that more career guidance is not necessarily beneficial and can lead to negative labor market outcomes such as higher unemployment and lower earnings. As ACA is targeted at the most vulnerable group in the German labor market these possibly lasting effects are disconcerting.

Studies evaluating the effectiveness of career guidance programs are mostly short-term evaluations. They are focused on advancement of career planning (Fitzenberger, Hillerich-Sigg, et al., 2020; Kerr et al., 2015; Peter and Zambre, 2017), educational outcomes like academic success (Carell and Sacerdote, 2017; Fitzenberger and Lickleder er, 2017), high school completion (Goux et al., 2015; Solga, Baas, et al., 2011), or transition in post-secondary education (Boockmann and Nielen, 2016; Borghans et al., 2015; Hoest et al., 2013; Neumark and Rothstein, 2007; Solga, Baas, et al., 2011). There is much less literature on medium- and long-term effects of career guidance activities.

Existing literature finds no or positive effects on labor market integration (Rodríguez-Planas, 2012; Saniter et al., 2019). Rodríguez-Planas (2012) evaluates with an RCT design a program including several different career guidance activities and finds positive effects on short-term educational outcomes, but no employment effects five years after treatment. Saniter et al. (2019) study the effect of the introduction of job information centers by the employment agency in the 1970s in Germany at a time when there was much less career guidance available.

Most of the studies cited above consider treatments that are targeted at students that head towards higher education, much fewer studies focus on career guidance programs for students below tertiary education (Boockmann and Nielen, 2016; Fitzenberger and Lickleder er, 2017; Neumark and Rothstein, 2007; Solga, Baas, et al., 2011). In her literature survey McNally (2016) emphasizes that the provision of information need to be well targeted and tailored to the needs of the young people in order to be effective.

The program ACA has also been evaluated with regards to short-term, educational outcomes like grades and the decision to upgrade the secondary school qualification (Fitzenberger and Lickleder er, 2017). Fitzenberger and Lickleder er (2017) do not find an overall treatment effect of the participation in additional career assistance (ACA). However, they find that ACA results in a reversal of educational plans, at least for some subgroups. Students who do not have the potential to upgrade their secondary school qualification improve their grades. If those students also do not have a migratory background they are more likely to upgrade their secondary school qualification with ACA. Whereas students with the potential of upgrading are less likely to reach the middle track secondary school qualification when participating in ACA.

We add to the literature by providing evidence on medium-term labor market effects of additional career guidance activities for students at the lower end of the skill distribution. With unique data which links survey data, administrative school data, and employment biography data using a quasi-experimental approach we do not only analyze the effect on employment, unemployment, and earnings in the medium-term, but also the type of entered vocational training. We show that our results are robust to many considerations with regards to the control group approach, implementation of the program, and subgroups or intermediate outcomes as drivers of the results.

The additional career assistance has no effect on the overall transition rate into vocational training and the probability to complete a vocational qualification within six years after grade 9. But analyzing the treatment effects over time, we find evidence for a delay in the transition into and completion of vocational training. ACA participation also does not result in a difference in drop-out probability or the type of vocational training. Thus

it seems unlikely that the delay enabled ACA participants to reach vocational training positions of higher quality. But we find negative treatment effects on employment and cumulative earnings within six years after grade 9. ACA participants also spend more time in unemployment. These effects are small as they accumulate over six years, but are still an undesired effect of a career guidance program. Examining heterogeneous treatment effects we find that only little effect heterogeneity by migratory background, but more by gender. Treatments effects are larger, and more negative for men.

The paper is organized as follows: Section 4.2 gives insight on relevant aspects of the (vocational) education system, players in career guidance, and describes the set-up of the evaluated program additional career guidance (ACA). Based on this, expectations on the treatment effect are drawn. Section 4.3 describes data and the empirical approach. The results are presented in Section 4.4, including heterogeneous treatment effects and robustness checks. Section 4.5 concludes.

4.2 Institutions, Career Guidance Activities, and ACA

Traditionally, the lower track of the German three-tier secondary school system means to prepare students for a vocational training after leaving school at the end of grade 9.[3] When completing grade 9 successfully, they receive the lower track secondary school qualification ('Hauptschulabschluss' or equivalent) which was sufficient for many vocational training occupations. However, with larger share of secondary school students graduating with a higher education entrance qualification ('(Fach-)Hochschulreife') and still entering the vocational training market (Bonin, Fitzenberger, et al., 2016) as well as demands of many vocational training occupations become more complex (Protsch, 2014), the direct transition into vocational education has become rarer for lower track secondary school students. Policy makers have reacted in several ways to this development.

One policy change has been the expansion of possibilities for lower track students to reach a middle track secondary school qualification ('Mittlere Reife') either by expanding lower track secondary schools' grade range up to grade 10 or by offering programs at vocational schools that reward the middle track secondary school qualification. At the time of our survey the state of Baden-Württemberg offers both: Continuing general schooling at the same school ('Werkrealschule') and the popular 2-year program 'Berufsfachschule' at vocational schools which offers both general education and vocational education in several occupational fields and rewards a middle track secondary school qualification. For continuing general schooling at the same school there was a GPA threshold to meet. For students showing the potential to reach the middle track secondary school qualification already at the end of grade 7, additional classes during grade 8 and 9 are offered. Students need to apply for the programs at vocational schools as well, with grades being an important admission criteria. As not all students are able to meet the required criteria, there exists a wide range of pre-vocational training programs that neither offer a vocational qualification nor general school qualification. Here students are supposed to be prepared for vocational training whenever skills are missing and they did not find vocational training position.

Additionally, career guidance measures have been expanded on many levels to improve the school-to-work transition, particularly for lower track secondary school students.

[3] With middle track secondary school lasting until grade 10 and also preparing for vocational education, and upper track secondary school lasting until grade 12/13 preparing for higher education.

The employment agency as the key player provides information and counseling at job information centers, introduced in the 1970s. Case workers specialized in apprenticeship and youth labor markets sometimes offer counseling-hours at lower track secondary schools to reduce the barrier to visit the job information center. Career planning has also become a part of the regular curriculum at lower track secondary schools. Identifying skills and interests using self-tests, learning about occupations as well as the write-up of applications is taught e.g. in German classes. Additional state-wide regulations set a minimum of required days in work experience placements (Schröder, 2015). Schools also independently take initiative beyond the state-wide career guidance activities by rearranging curriculum to give more time to extended work experience placements, partner up with firms for work place visits or even guaranteed apprenticeship positions. Additional career guidance has been also been part of local initiatives by municipalities, local employment agencies, and non-profit organizations.

The additional career assistance (ACA) studied here is a local initiative "Erfolgreich in Ausbildung" by municipality, employment agency, and educational providers for lower track students in Freiburg, a city in Southwest Germany. It shares the goals of many similar local policy interventions to increase transitions in vocational training from lower track secondary schools, to improve decision making, to deepen knowledge and experiences about occupations, and to augment non-cognitive skills. The program takes place in grade 8 and 9 of lower track secondary schools both during teaching time and after school.
In grade 8 the primary goal is to provide students with information about possible occupations and widen the perspectives on educational and occupational opportunities. This curriculum takes place both in class and in small groups. Individually or in small groups students are supported with research on occupations, visiting days at workplaces, and work experience placements. Students are supposed to become aware about their skills, preferences, and to identify a fitting transition path and occupation.
In grade 9 the focus moves to advancing the occupational choice as well as the decision on the continuation of schooling or transition in vocational training and implementing necessary steps towards the career goals. Additionally to giving career guidance lessons in class, ACA staff provides occasional individual and small group counseling, support for apprenticeship and school applications, and chaperons work experience placements. When students are interested in an apprenticeship, they are referred to the employment agency's case workers for further counseling and support. The program is implement by five educational providers which are responsible for one to four schools each. ACA staff has a background as social workers or social pedagogues.

For the development of hypotheses and expectations we need to consider the behavioral aspects of school-to-work transitions of lower track secondary school students. Lower track students not only need to decide on an occupation at a relatively young age, but also whether they can and want to start a vocational training directly after school. The described options to potentially increase their chances on the vocational training market by upgrading their general school qualification or gaining first vocational knowledge have to be carefully considered in terms of risks and returns. Regarding these decision career guidance measures should support adolescents. Ideally, ACA decreases imperfect information and uncertainty towards expected returns to different occupations and own abilities and thus increases the probability of a good match on the labor market and a smooth school-to-work transition. Hence, according with the intended aims of the program we would expect a positive effect of ACA.
A threat to successful career assistance could be an information overload which can easily

happen with the multitude of collaterally offered career guidance. This is particularly likely the case for lower track students as they are the target of many career guidance measures as described above. Additionally, in the case of lower track students, it seems important to prevent choice avoidance. Being overwhelmed by the occupational options as well as a projection bias[4] could lead lower track students to postpone their labor market entry by continuing schooling (Lavecchia et al., 2016). Thus as McNally (2016) has concluded in her survey, successful career guidance needs to be well tailored at a relevant target group, the timing needs to be right, and personalized programs have shown better results. This might not be entirely true for ACA: ACA staff was mostly occupied with giving lessons in the class or small group context and only occasionally counseled students personally. Those lessons which are the focus of the program might not sufficiently reduce imperfect information and uncertainty, but foster an information overload when there is not enough time to counsel individually. We know from other studies that counseling is an important instrument to support career planning (e.g. Fitzenberger, Hillerich-Sigg, et al., 2020). Especially lower track students who might have more difficulties making use of a standard classroom setting seem to need the complementary counseling to transfer information to their personal situation.

Based on the consideration above and the finding by Fitzenberger and Lickleder (2017) the effect of ACA on the probability to transition into vocational training is ambiguous. It is likely that different mechanisms off set each other and we find no effect. It is possible that the start of vocational training is delayed because Fitzenberger and Lickleder (2017) find that at least subgroups of ACA participants are likely to upgrade their secondary school qualification. An information overload through ACA would make choice avoidance more likely, thus less likely to conduct the necessary steps of career planning like writing applications in a timely and effective manner. Accordingly, we would also expect a delay in the completion of vocational training.
Ideally, ACA would improve the quality of vocational training even if its start is delayed. From previous results, e.g. shown by Bonin, Fitzenberger, et al. (2016), we know that ACA improves the development of career planning during school and has also increased the number of work experience placements. Possibly, ACA participants are able to process the information they received over time and thus end up in better vocational training positions and drop out less.
The expectations regarding medium-term labor market outcomes like employment, unemployment and earnings are ambiguous: The expected delay of the transition into vocational training makes negative ACA effects on cumulative labor market outcomes likely. However, if ACA participants are able to enter vocational training positions of higher quality they might be more successful in the labor market in the medium-term. Hence, the expectations on the overall effect of ACA on labor market outcomes are ambiguous.

We know from previous work on educational outcomes (Fitzenberger and Lickleder, 2017) that subgroups might be affected differently by ACA. Hence, we also develop hypotheses for subgroups by migratory background and gender.
A large share of students at lower track secondary schools have migratory background. In our sample students with migratory background make up 40 % in the treatment and 29 % in the control group. Among other things, students with and without migratory background differ with respect to educational aspirations which might be relevant for the school-to-work transition. For instance, adolescents with migratory background

[4]The projection bias gives a preference for known circumstances, i.e. school, before unknown circumstances, i.e. the vocational training.

tend to have higher educational aspirations and a preference for general education over vocational education (Becker and Gresch, 2016; Beicht, 2015; Relikowski et al., 2012; Zimmermann, 2019). We would generally expect career guidance to be particularly beneficial for students with migratory background because they might need additional information about the German labor market and vocational education system. ACA should help those students to form realistic aspirations and adjust their expectations, but it remains unclear whether ACA is sufficiently tailored to the needs of this target group.
Career guidance activities can help to adjust expectations and form realistic aspirations on educational and occupational opportunities. This might be particularly relevant when individuals are overconfident. There is literature of behavioral economics which suggest that men tend more towards overconfidence than women, also with regard to educational outcomes (Dahlbom et al., 2011) Thus they might be particularly in need for career guidance. However, when ACA is not well enough tailored to this need to adjust expectations and only adds information on more opportunities, it might feed overconfidence. Thus it seems likely that male and female students react differently to ACA, but the direction of the effect heterogeneity is ambiguous.

4.3 Data and Empirical Approach

We use unique data that has been collected by Fitzenberger and Lickleder (2015, 2017) since 2007 at lower track secondary schools in Freiburg and Freiburg region in Southwest Germany. We have survey data beginning in grade 8 for two consecutive cohorts of lower track secondary school students. The students finished 9^{th} grade in 2009 and 2010 respectively. We observe them 3 to 4 times during school (depending on the cohort) and twice after graduating and can add survey data conducted with parents and teachers (two waves). Information on grades, gender, age, and migratory background[5] are drawn from administrative school data (Fitzenberger and Lickleder, 2015) and are thus very reliable.

In this paper the survey data is linked with administrative social security data. We use the weakly anonymous Integrated Employment Biographies (IEB) by the Institute for Employment Research (IAB) including employment and social security biographies upto December 2016.[6] We have detailed spell information on employment (apprenticeships, marginal employment, socially secured employment), including daily wages and occupation, unemployment, and participation in active labor market policy programs. There is also limited information on secondary school and vocational qualification. As we have two cohorts finishing 9^{th} grade one year apart we only use data up until December 2016 for cohort 2 and December 2015 for cohort 1, thus we observe 6 1/2 years after finishing 9^{th} grade for both cohorts. The linkage with the IEB data was possible for 551 individuals.[7]

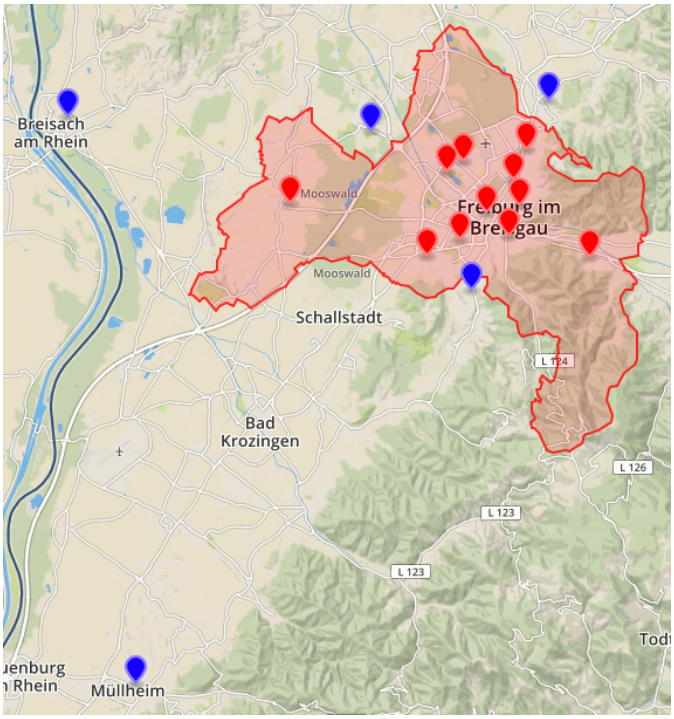
For our empirical strategy to identify the causal effect of the additional career assistance (ACA) we make use of the fact that ACA was only implemented at lower track

[5] Migratory background is defined as either having a foreign citizenship or being born in a foreign country.

[6] Data access was provided via on-site use at the Research Data Centre (FDZ) of the German Federal Employment Agency (BA) at the Institute for Employment Research (IAB) (project No. fdz970). See Jacobebbinghaus and Seth (2007) and Oberschachtsiek et al. (2009) for data documentation.

[7] 664 students were surveyed, 599 of them (90 %) gave their consent for the data linkage (Fitzenberger and Lickleder, 2017), however not all of them were found in the IEB.

Figure 4.1: Location of Treatment and Control Group (Schools)



Notes: Source: Open source map from www.openstreetmap.org [created on 11 August 2017] - red shaded area and dots for address of LTSS schools in data added. Red area/dots: City of Freiburg/treatment schools. Blue dots: Control schools in surroundings of Freiburg. Geographic Distance Freiburg City Center to Müllheim City Center: 27 km.

secondary schools in Freiburg city. Students attending lower secondary schools in the area around Freiburg hence serve as control group (see Figure 4.1 for the location of the schools). We have 394 participating individuals and 157 non-participating individuals in the sample. Those students went to 16 (11 treatment) schools. Most of the control schools are located very close to Freiburg city center and with sufficient public transportation, commuting is not an issue (Fitzenberger and Lickleder, 2017). Students from Freiburg and Freiburg region both face the same vocational training market which is important as local labor market conditions are important drivers of school-to-work transitions (see e.g. Riphahn (2002)). There are differences with regard to some personal characteristics as shown in Table 4.1. Particularly, the differences in the share of female students, share of students with migratory background, and teachers' assessed self-reliance in career planning (variable: individual talk desirable)[8] are too large and significant to assume random selection into treatment. However, as we observe relevant variables regarding individual characteristics, family background, residential area, school characteristics, academic achievements, and non-cognitive skills, we assume that control and treatment group are identical conditioning on those variables. The variables are either determined before the start of the treatment or collected at the beginning of the treatment and are unlikely to be already affected by the treatment.

We use a number of outcome variables to identify the effect of additional career assistance on the school-to-work transition and labor market entry. We first look at binary outcome

[8]Teachers were asked "Do you think individual talks with the students to improve the self-reliance regarding career planning are desirable?".

Table 4.1: Deskriptive Statistics of Treatment and Control Group

	ACA	no ACA	Diff.
Gender: Female	0.49	0.39	0.10**
Migratory background	0.40	0.29	0.11**
cohort 1 (grade 9 in 08/09)	0.54	0.55	-0.01
Father's school qualification: middle track or higher	0.30	0.36	-0.05
Migrant share in residential area	0.14	0.09	0.05***
School offers grade 10	0.65	0.70	-0.05
Additional classes (AC)	0.53	0.50	0.03
Grade point average (GPA) (German/Math) grade 7	2.92	2.98	-0.06
Teacher: Individual talk desirable	0.58	0.40	0.18***
Teacher: non-cognitive skills	0.31	0.39	-0.08
Observations	394	157	

Notes: Stat. sign. difference: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Missing values in father's school qualification, grades, and non-cognitive skills are set to zero. The average non-cognitive skills are standardized by the sample standard deviation of the individual averages, but not demeaned. Missing values in additional classes imputed with regression-based imputation.

variables giving a first impression of the shape of the school-to-work transition:

- Start of an vocational training within 6 1/2 years after finishing 9$^{\text{th}}$ grade, which is observed in the IEB data or when a vocational qualification is documented in the IEB[9]
- Drop-out of vocational training within the first year, as observed in the IEB[10]
- Completion of vocational qualification within 6 1/2 years after finishing 9$^{\text{th}}$ grade.[11]

We estimate the ACA effect on the probability to start a vocational training, drop out of a vocational training and complete a vocational qualification with Probit models:

$$P(y_i = 1|X_i) = \Phi(\alpha + \beta T_i + \theta X_i) \tag{4.1}$$

where y_i denotes the binary outcome variable, T_i the treatment dummy, and X_i stands for the control variables (see Table 4.1).

The analysis of the transition into vocational training does not account for potential differences in the type of vocational training which could result from additional career assistance. We henceforth consider the following proxies for the quality of the entered vocational training:

- The starting wage during the vocational training (daily wage)

[9] Full-time school-based vocational training is not observed in the IEB data. If the vocational qualification is completed within 6 1/2 years and it is documented in the IEB afterwards, the individual is coded to have started a vocational training. This approach potentially underestimated the true share of individuals starting a vocational training, as we only observe the completed school-based vocational qualification if the individuals are observed in the IEB after the training. There is no significant differences between treatment and control group in the probability to complete a school-based vocational qualification.

[10] Additionally, if a full-time school-based vocational qualification is observed in the IEB, we assume that the individual did not drop out.

[11] We consider both apprenticeship spells observed in the IEB data as well as information on completed vocational qualification provided by employer or employment agency (when vocational training was full-time school-based).

- the socioeconomic status (SES) of the vocational training occupation (ISEI-08): The ISEI-08 score developed by Ganzeboom (2010) and Ganzeboom, Graaf, et al. (1992) maps occupations in a range of 11.56 to 88.96 in a combination of level of education and income.
- the prestige of the vocational training occupation (SIOPS-08). The SIOPS-08 score developed by Ganzeboom and Treiman (2003) and Treiman (1977) ranges from 0 to 100 based on surveys from 55 countries.
- the average (monthly) wage of 2010 in the vocational training occupation[12].

When we observe a completed vocational qualification, but no apprenticeship in the data, i.e. the individual completed a full-time school-based vocational training, we take the occupation of the spells providing the information of vocational qualification as the vocational training occupation. In those cases the starting wage during the vocational training is set to zero as students in school-based vocational training programs do not receive a wage during the vocational training.

Finally, we look at labor market outcomes that summarize the school-to-work transition in the first 6 1/2 years after finishing general schooling:

- cumulative days in apprenticeship or employment subject to social security contributions[13]
- cumulative earnings in prices of 2015
- cumulative days in unemployment
- cumulative days in programs of active labor market policy (ALMP), starting after grade 9 and not including any career guidance programs.

Thus our baseline model for identifying the causal effect of additional career assistance (ACA) is:

$$y_i = \alpha + \beta T_i + \theta X_i + u_i, \tag{4.2}$$

where y_i denotes the continuous outcome variable, T_i the treatment dummy, and X_i stands for the control variables (see Table 4.1).

As the school-to-work transition is a dynamic process, we additionally identify the treatment effect of ACA on cumulative incidences in the six years elapsed since grade 9. Hence the models for the cumulative incidences of starting a vocational training and completing a vocational qualification are:

$$P(y_{i,t} = 1|X_i) = \Phi(\alpha + \beta T_i + \theta X_i) \tag{4.3}$$

and the models for the cumulative days in employment, unemployment, ALMP participation, and earnings:

$$y_{i,t} = \alpha + \beta T_i + \theta X_i + u_i \tag{4.4}$$

where respectively $y_{i,t}$ denotes the cumulative incidence or outcome in year t after grade 9, up until year 6.

[12] Using East/West-gender-cells in the occupation by occupation classification KldB2010. Data source of wages: Federal Statistical Office (Statistisches Bundesamt), Verdienststrukturerhebung 2014.

[13] Here we can only include days in apprenticeships that are observed in the IEB data. Full-time school-based vocational training is not observed in the data and hence is not counted towards the cumulative days in employment. This would only bias our treatment effect if there is a difference by ACA participation in entering a full-time school-based vocational training. We do not find a difference by ACA participation among the observed completed vocational qualification which also includes those that are acquired at a vocational school (95 % of the observed completed vocational qualifications are gained through an apprenticeship.)

4.4 The Effect of Additional Career Assistance on Labor Market Entry

Table 4.2 gives a descriptive overview of the average outcomes by treatment and control group. Around 80 % of the former lower track students have started a vocational training. Among these, 12-19 % drop out within the first year after starting the vocational training. Almost half of the students in the control group have completed a vocational qualification, significantly more than students participating in ACA. Students participating in ACA earn slightly less at the beginning of their vocational training (21.17 vs. 19.99 Euros per day), the vocational training occupations do not significantly differ in terms of average wage, socioeconomic status, and prestige. The average ISEI-08 score, the measure for the socioeconomic status (SES) of the occupation, ranges with 34 and 35 below the score of 37 which has been determined to represent occupations that are mostly occupied by individuals having reached at least a middle track secondary school qualification (Schuchart, 2011). While skilled manual workers (mostly craft workers, some skilled service, and skilled machine operators) reach an average ISEI score of 36, semi-unskilled workers (mostly machine operators, elementary laborers, elementary sales and services) reach an average ISEI score of 31 (Ganzeboom and Treiman, 1996). Individuals in the control group have on average been in an apprenticeship or employment for 1182 days over the course of 6 1/2 years, roughly 200 days more than students participating in ACA. Equivalently, they have been less unemployed and earned more than participants in ACA. 57 % of the participating students have been unemployed at least once, totaling in 83 days of unemployment within 6 1/2 years after finishing 9^{th} grade. Earnings of participating individuals on average accumulate to 32,356 Euros over the course of 6 1/2 years, almost 9,000 Euros less than the average of the control group. ACA participants spend on average 214 days in programs of active labor market policy (ALMP), while non-participants only spend 156 days in ALMP programs.

Table 4.2: Descriptive Statistics of Outcome Variables by Treatment and Control Group

	ACA	no ACA	Diff.	Obs.
Start vocational training within 6 1/2 years	0.79	0.83	-0.04	551
Drop-out vocational training first year	0.19	0.12	0.07*	440
Completed voc. qualification within 6 1/2 years	0.38	0.48	-0.10**	551
Starting wage in vocational training	19.99	21.17	-1.18	440
Average wage in voc. training occupation	2,638	2,699	-61.10	430
Socioeconomic status (SES) of voc. training occupation	35.01	33.89	1.12	430
Prestige of voc. training occupation	39.92	39.69	0.22	430
At all in unemployment	0.55	0.36	0.19***	551
Days in unemployment within 6 1/2 years	80	46	35***	551
Days in apprenticeship/employment within 6 1/2 years	875	1,053	-178***	551
Days in ALMP programs within 6 1/2 years	214	156	57*	551
Cumulative earnings within 6 1/2 years (prices of 2015)	32,256	41,102	-8,846***	551

Notes: Stat. sign. Difference: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Drop-out and starting wage conditional on starting a vocational training, variables on voc. training occupation only available if occupation is observed in IEB.

We cannot conclude from the descriptive differences whether they are caused by ACA or by a negative selection into ACA. As mentioned in Section 4.3 the causal identification with the control group approach requires conditioning on covariates. We are

confident that the control group approach is robust when considering the previous work of Fitzenberger and Lickleder (2017).

While treatment and control group share the same labor market and we can control for relevant socioeconomic differences, one could worry that differences in attitudes and aspirations are drivers of the effect. The control group has a higher share of more rural areas while the treatment group is more urban. We thus check differences in educational aspirations of parents between treatment and control group which would be a sign for differences in norms that might influence labor market entry. There are no significant differences in the parents' educational aspirations for their children and hence it is unlikely that the effects are driven by differences in social norms regarding education.

In order to test whether there are differences between treatment und control group before the start of ACA we consider outcome variables that are predetermined. We conduct placebo tests for the grade point average (GPA) in grade 7 (Table 4.A.4 in the Appendix), the participation in additional classes (as preparation to reach the middle track school qualification) (Table 4.A.6 in the Appendix), and the teacher's assessed non-cognitive skills (Table 4.A.5 in the Appendix) (Fitzenberger and Lickleder, 2017). We find no placebo effect of ACA on the participation in additional classes, but ACA participants have better grades and less non-cognitive skills holding other characteristics constant. The placebo effect on grades is driven by ACA participants with migratory background, while participants without migratory background drive the negative placebo effect on non-cognitive skills. These placebo tests show that is very important to control for grades and non-cognitive skills in the main estimations as there are systematic differences between treatment and control group.

4.4.1 Overall Treatment Effect

Now we correct for the nonrandom selection in treatment by conditioning on relevant covariates and show the overall effect of additional career assistance (ACA) on the transition in vocational training using Model 4.1. The average marginal effects are shown in Table 4.4 in the first panel. There is no effect of ACA on outcomes describing the transition in vocational training: It neither affects the probability to start, to drop out, nor to complete a vocational training within 6 1/2 years after grade 9.

Table 4.3: ACA Effect on Labor Market Entry

	ACA		Observations
Start vocational training	-0.01	(0.05)	551
Drop-out vocational training	0.04	(0.03)	440
Completed vocational qualification	-0.05	(0.05)	551
Starting wage voc. training	-1.80*	(0.92)	440
Average wage in voc. training occupation	4.01	(42.22)	430
SES of voc. training occupation	0.31	(1.10)	430
Prestige of voc. training occupation	-0.75	(0.82)	430
Days in unemployment within 6 years	41.80***	(9.47)	551
Days in apprenticeship/employment within 6 years	-124.49**	(48.14)	551
Days in ALMP programs within 6 years	30.73	(42.30)	551
Cumulative earnings within 6 years	-6741.51***	(1872.67)	551

Notes: Average marginal effects in first panel of probit estimations, OLS otherwise. Controls included, Standard errors in parentheses, clustered by school. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. See Table 4.A.1 for full models.

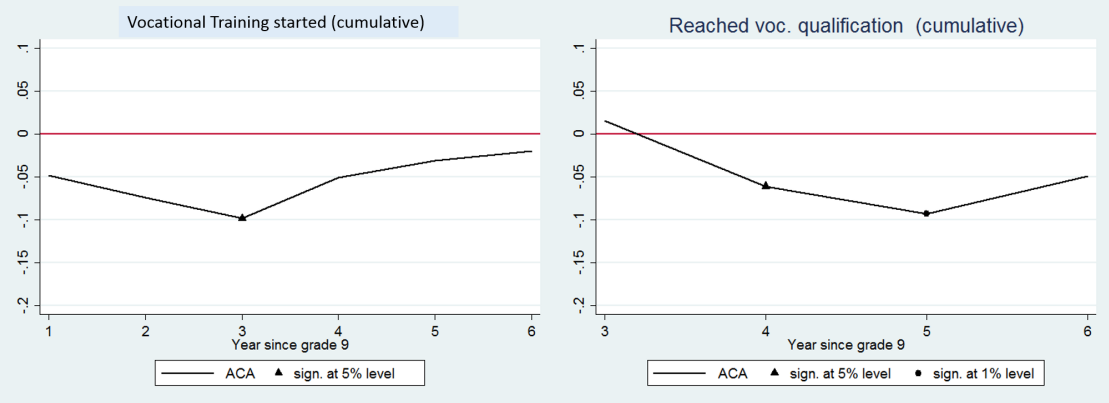
Table 4.4: ACA Effect on Labor Market Entry with p-value correction

	ACA	p-value	corr. p-value	Obs.
Start vocational training	-0.01	0.807	1.614	551
Drop-out vocational training	0.04	0.220	1.54	440
Completed vocational qualification	-0.05	0.288	1.728	551
Starting wage voc. training	-1.80	0.069*	0.552	440
Average wage in voc. training occupation	4.01	0.926	0.926	430
SES of voc. training occupation	0.31	0.784	2.352	430
Prestige of voc. training occupation	-0.75	0.378	1.89	430
Days in unemployment within 6 years	41.80	0.001***	0.011**	551
Days in apprenticeship/employment within 6 years	-124.49	0.021**	0.189	551
Days in ALMP programs within 6 years	30.73	0.479	1.916	551
Cumulative earnings within 6 years	-6741.51	0.003***	0.03**	551

Notes: Average marginal effects in first panel of probit estimations, OLS otherwise. Controls included. Standard p-values and for multiple testing corrected p-values (Bonferroni-Holms method) in columns 2 and 3. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. See Table 4.A.1 for full models.

The presented results are the overall treatment effect for the whole time span of over 6 years after finishing 9th grade. Figure 4.2 shows the cumulative incidence of starting a vocational training and completing a vocational qualification until the respective year after 9th grade, referring to Model 4.3. There is a significant negative effect of ACA participation on the probability of starting a vocational training until year 3 after 9th grade. Three years after grade 9 ACA participants are 10 pp (percentage points) less likely to have started a vocational training until then. The effect converges again towards zero after that. This might indicate that students participating in ACA started their school-to-work transition delayed. Correspondingly, they also reach a vocational qualification later. In Figure 4.2 we show a significantly negative cumulative effect on the probability to reach a vocational qualification until year 4 and 5 since grade 9. Five years after grade 9 ACA participants are 10 pp less likely to have reached a vocational qualification. The effect decreases again in year 6 and seems to converge to zero as well.

Figure 4.2: ACA Effect on Transition into Vocational Training and Completion of Vocational Qualification over Time



Notes: Average marginal effects of Probit estimations, controls included, standard errors clustered by school, N=551. Find full models of year 6 outcomes in Table 4.A.1.

A delayed school-to-work transition per se does not indicate that the school-to-work transition was not successful. The delay might be due to upgrading of general education qualifications and the delay may have been used to advance the occupational orientation. Thus we check next whether ACA has an impact on the type of vocational training the individual starts with the results in the second panel of Table 4.4, referring to Model 4.2. Overall, we do not observe a different type of vocational training for ACA participants. There is no significant difference in the average wage, socioeconomic status, and prestige of the vocational training occupation. There is only a weakly significant difference in the starting wage, with a small negative point estimate.

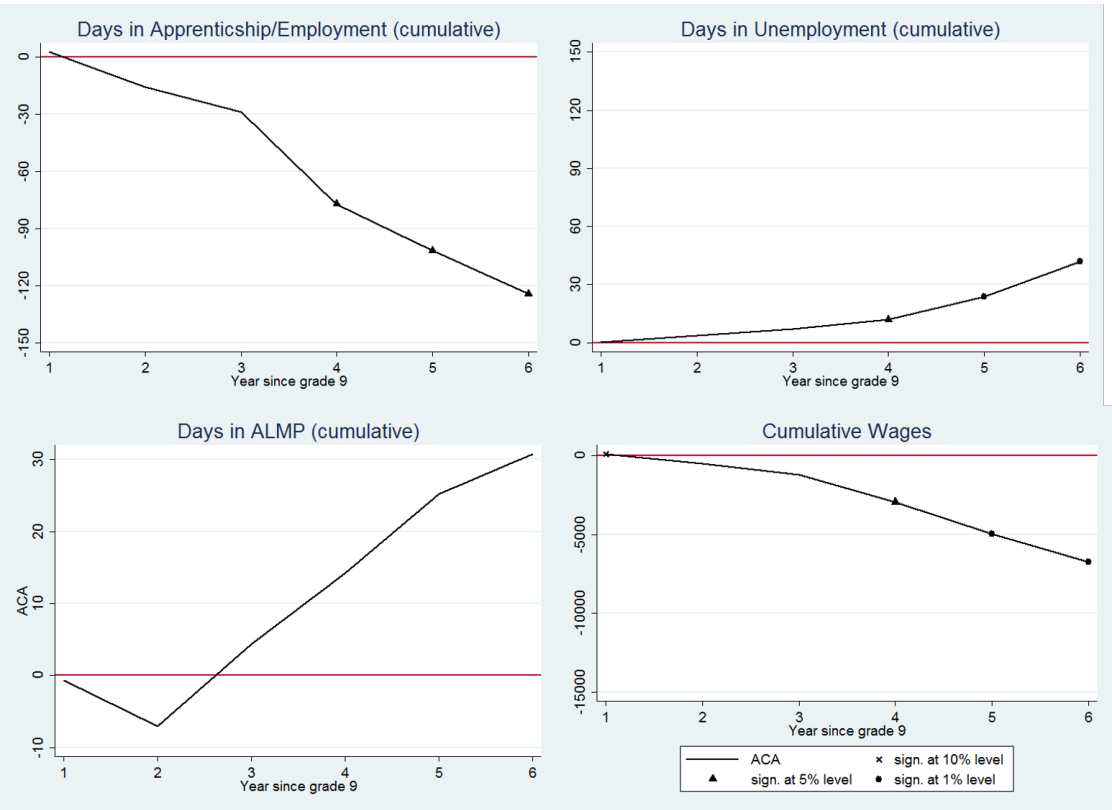
Finally, we evaluate the effect of additional career assistance on medium-term labor market outcomes summarizing the labor market entry. Figure 4.3 gives the cumulative days in employment, unemployment, ALMP programs, and cumulative earnings over time after grade 9 (see Model 4.4). We find significant and increasing negative effects of ACA on employment and earnings, and the corresponding positive effect on unemployment starting in year 4. The effect on ALMP program participation is not significant, but the point estimates suggest that ACA participants accumulate more days in active labor market policy programs from year 4 on. The effects particularly increase between year 5 and 6, thus it is unlikely that the effects are mainly due to the delayed start of

vocational training. While ACA participants have a 18 pp higher probability to become unemployed, there is no significant difference in the probability to be at all in employment or to participate in ALMP programs (not shown). The effects total in 124 days less in apprenticeship or employment, 42 days more in unemployment, and 6,742 Euros less earnings after 6 1/2 years after grade 9 (see third panel of Table 4.4 for the OLS estimation results with the totals after 6 1/2 years).

Table 4.A.1 in the Appendix presents the estimation results of the full models including the control variables that might as well determine the labor market outcomes (corresponding to the ACA effects in Table 4.4). Across all outcome variables gender and migratory background seems to be the most relevant additional determinants besides the participation in ACA. Table 4.A.1 shows that women are more likely to drop out of vocational training and are in lower paying vocational training positions, but in occupations with higher socioeconomic status and prestige. Accordingly, they also have significantly less cumulative earnings while there are no gender differences in other cumulative labor market outcomes. We find that students with migratory background are less likely to start a vocational training. This lower probability might be due to many reasons, one of them being higher educational aspirations and a preference for general education over vocational education (Becker and Gresch, 2016; Beicht, 2015; Relikowski et al., 2012; Zimmermann, 2019). However, we find as well that if they start a vocational training, they seem to find positions with higher wages, socioeconomic status, and prestige and are less likely to drop out. The lower probability to start a vocational training of students with migratory background might lead to a positive selection of those entering vocational training and explain these results. We do not find significant effects of migratory background on cumulative labor market outcomes (see Table 4.A.1).
Other control variables are sporadically significantly associated with the outcome variables, but if so, in relative large dimension: Students living in neighborhoods with a medium share of migrants (11-20 %) are less likely to complete a vocational qualification, work less days and earn less cumulative earnings compared to those living in neighborhoods with a low share of migrants (10 % or less). Students who had the potential to upgrade their secondary school qualification and thus participated in additional classes are less likely to start a vocational training, but if they do the occupation of their vocational training is of a higher socioeconomic status. They also spend less days in ALMP programs.

Overall we do not find lasting effects of additional career assistance on the probability to start or complete a vocational training up to six years after grade 9. But transition in vocational training is delayed, which we expected. Our expectations of a positive effect of ACA on the type of vocational training are not realized as there are no differences. We find significant and negative effects on cumulative labor market outcomes regarding employment and earnings as well as more time in unemployment. These effects are small, but relevant as the intended goal of the ACA program is to improve the labor market entry of its participants. As we do see a tendency of catching up with respect to the completion of vocational training, we might see a similar catch-up also over the life cycle. However, as we do not see differences in the type of vocational training, the delayed start of a vocational training does not result in a higher quality of vocational training.

Figure 4.3: ACA Effect on Medium-Term Cumulative Labor Market Outcomes over Time



Notes: OLS estimations, controls included, standard errors clustered by school, N = 551. Find full models of year 6 outcomes in Table 4.A.1.

4.4.2 Heterogeneous Treatment Effects

The overall treatment effect of additional career assistance is small in size and partly insignificant. Effects might differ for subgroups, with generally different labor market experiences. Fitzenberger and Lickleder (2017) also find different effects of ACA on educational outcomes by subgroups.

As described in Section 4.4.1 individuals with migratory background experience differences in the labor market entry, particularly with regard to transition into and drop-out of vocational training and the type of vocational training. Thus, we want to examine whether ACA has heterogeneous effects by migratory background. Model 4.5 identifies heterogeneous effects by migratory background,

$$y_i = \alpha + \beta_1 T_i * m_i + \beta_2 T_i * \overline{m}_i + \theta X_i + u_i, \tag{4.5}$$

where β_1 is the treatment effect for students with migratory background and β_2 the treatment effect for students without migratory background.[14]

Males and females differ both with respect to educational and labor market outcomes, thus it seems likely that they might also react differently to additional career assistance.

[14]The respective Model 4.5 for binary outcomes is $P(y_i = 1|X_i) = \Phi(\alpha + \beta_1 T_i * m_i + \beta_2 T_i * \overline{m}_i + \theta X_i)$.

Model 4.6 identifies heterogeneous effects by gender,

$$y_i = \alpha + \beta_1 T_i * female_i + \beta_2 T_i * male_i + \theta X_i + u_i, \tag{4.6}$$

where β_1 is the ACA effect for women and β_2 the ACA effect for men.[15]

The presented estimation results will always be the treatment effect when compared to the respective subgroup in the control group.

Migratory Background

The results of the estimations of the ACA effects by migratory background are presented in the first panel of Table 4.A.2 in the Appendix. The first three columns show that there are no significant heterogeneous treatment effects by migratory background on the probability to start, drop out, or complete a vocational training.

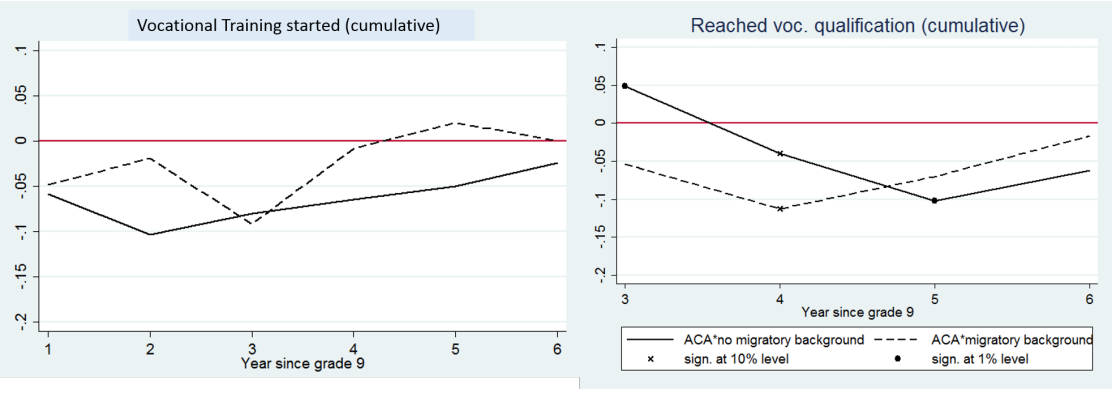
Turning to the dynamics of the treatment effect on school-to-work transition, we do not find significant heterogeneous effects for the start of a vocational training over time (Figure 4.4). However, the dynamic effects on the completion of the vocational qualification (Figure 4.4) differs by migratory background: Students without migratory background benefit at first from participating in ACA, as they are significantly more likely to complete a vocational qualification within three years after grade 9. From year 4 onward the cumulative incidence turns into a negative treatment effect for this subgroup: They are less likely to reach a vocational qualification, particularly in year 5 when they are 10 pp less likely to having completed a vocational training by that time. The treatment effect decreases again in year 6, but remains larger than for the subgroup of students with migratory background. ACA participants with migratory background have a lower probability to reach a vocational qualification compared to students with migratory background not participating in ACA, particularly in year 4 when the effect is significant. The effect converges almost to zero in year 6. Thus ACA seems to be helpful for students without migratory background to transition fast into vocational training, however, the control group soon makes up the leeway and the positive treatment effect turns into the temporarily negative treatment effect, which is also the pattern we estimate for all ACA participants together (Figure 4.2).

Considering the type of vocational training, we find no significant treatment effects by migratory background as Model 4.5 of Table 4.A.2 in the Appendix shows and thus no heterogeneity.

The last columns in Table 4.A.2 in the Appendix show the treatment effects by migratory background on the cumulative labor market outcomes. ACA seems to have a more negative effect on treated students without migratory background than on treated students with migratory background. Treated students without migratory background have 46 more days in unemployment than the respective subgroup of the control group, while treated students with migratory background have been unemployed for 33 more days. Students without migratory background also have 153 less days in apprenticeship or employment subject to social security contributions than their counterparts in the control group, while students with migratory background have a much smaller and insignificant effect. Both treatment effects on the days in ALMP programs are not significant, however, the point estimate with 40 days is much larger for the subgroup without migratory

[15] The respective Model 4.6 for binary outcomes is $P(y_i = 1|X_i) = \Phi(\alpha + \beta_1 T_i * female_i + \beta_2 T_i * male_i + \theta X_i)$.

Figure 4.4: Heterogeneous ACA Effects on Transition into and Completion of Vocational Training over Time by Migratory Background



Notes: Average marginal effects of Probit estimations, reference group is the respective subgroup without ACA, controls included, standard errors clustered by school, N=551.

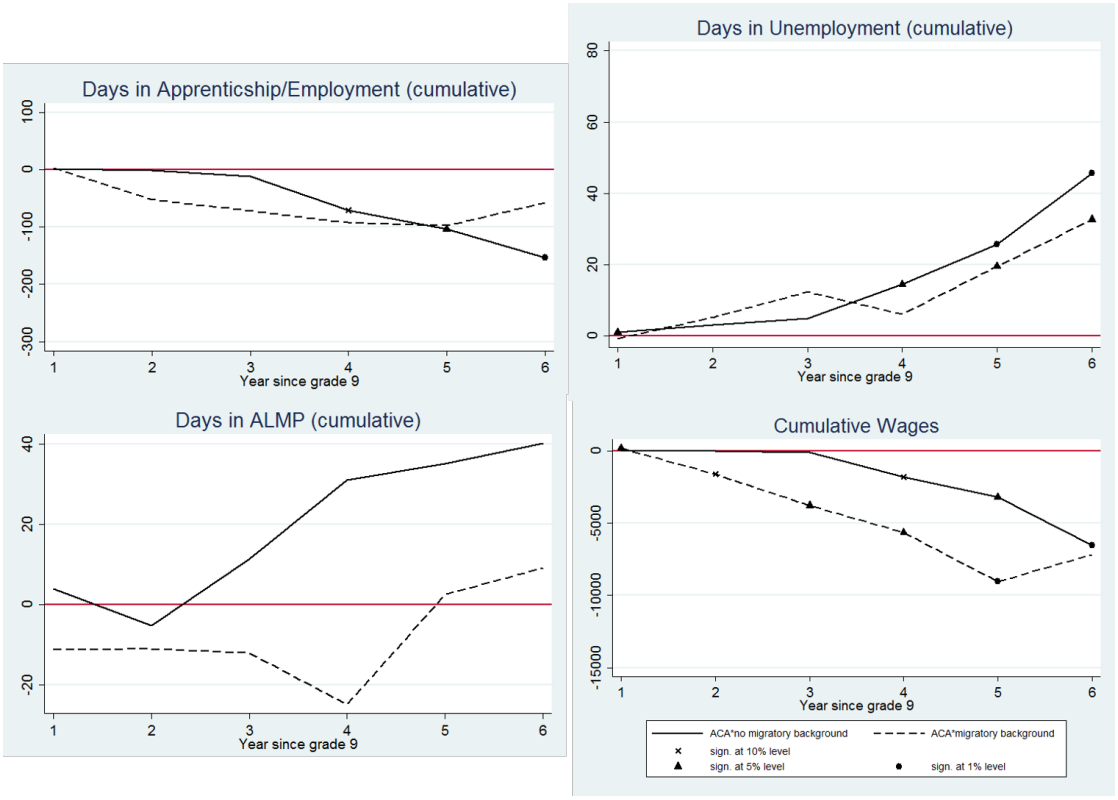
background than the subgroup with migratory background (9 days). Considering the effect's development over time in Figure 4.5 we even see that ACA participants with migratory background have spent less days in ALMP programs up to four years after grade 9 compare to non-participants with migratory background. Even though the effects are not significant, ACA seems to reduce the days in ALMP programs for students with migratory background at least in the first years after school. The more positive picture for participants with migratory background does not hold for the cumulative earnings, where the negative treatment effects for students with migratory background grow larger upto year 5 after grade 9 (see Figure 4.5). In year 6, the treatment effect heterogeneity by migratory background is small.

There is no effect heterogeneity in the transition into vocational training by migratory background. We only find a small advantage of treated students without migratory background shortly after leaving school. Apparently, some of them are able to transition faster into vocational training and complete their vocational qualification than the respective control group. However, the control group without migratory background makes up the leeway. There are no heterogeneous treatment effects with respect to the type of vocational training. Studying the cumulative labor market outcomes we find the treatment effect to be less negative for students with migratory background. The partly positive effects of migratory background on type of the vocational training and probability of drop-out, discussed above, are not driven by treated students with migratory background. As individuals with migratory background, in general, tend to have more difficulties on the labor market, ACA did not make it worse, but also was not particularly helpful either.

Gender

Model 4.6 in Table 4.A.2 in the Appendix shows that treatment effects differentiated by gender with regard to start of vocational training, drop-out, and completing a vocational qualification are not significant. Contrary to migratory background, we also find no relevant heterogeneity in the dynamic treatment effects regarding start and completion of vocational training over time. The treatment effects on type of vocational training

Figure 4.5: Heterogeneous ACA Effect on Medium-Term Cumulative Labor Market Outcomes over Time by Migratory Background



Notes: OLS estimations, comparison group is the respective subgroup without ACA, controls included, standard errors clustered by school, N=551.

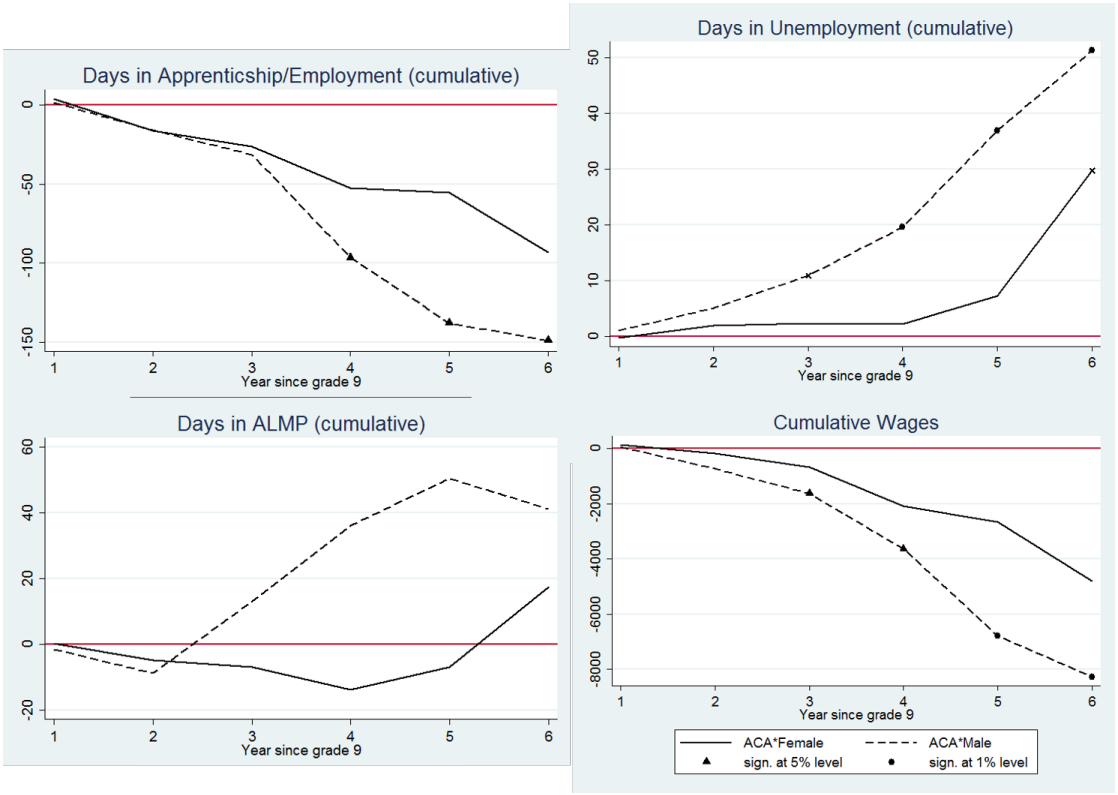
also do not differ for males and females.

Heterogeneity in treatment effects become more apparent for cumulative labor market outcomes, as shown in Model 4.6 of Table 4.A.2. Men participating in ACA are the driver of the overall negative treatment effects. Treated males spent significantly 51 days more in unemployment, 149 days less in apprenticeship or employment (subject to social security contributions), and lose 8,267 Euros in cumulative earnings by participating in ACA. For treated females the treatment effects are not or only weakly significant. The point estimates also indicate worse labor market outcomes among the treated females compared to their counterparts in the control group, but the effects are much smaller than for males.

Dynamic treatment effects for females over time are mostly not significant as shown in the graphs in Figure 4.6. While treated males spent more days in unemployment than the control group from year 1 after school on, treated females are not affected until year 5 after school. Then, however, the effect increase is relatively steep. The treatment effects on days in apprenticeship or employment and cumulative earnings develop in a slightly more parallel manner over time, however, the effect size diverges more dynamically. The treatment effects on cumulative days in ALMP programs are insignificant, but still indicate that female treated individuals have a lower probability to attend ALMP programs up until year 5 after school and only six years after school the treatment effect becomes positive. On the contrary male treated individuals start

out with a negative point estimate, but show a sharp increase already in the third year after school.

Figure 4.6: Heterogeneous ACA Effects on Cumulative Outcomes of Labor Market Entry over Time by Gender



Notes: OLS estimations, reference group is the respective subgroup without ACA, controls included, standard errors clustered by school, N=551.

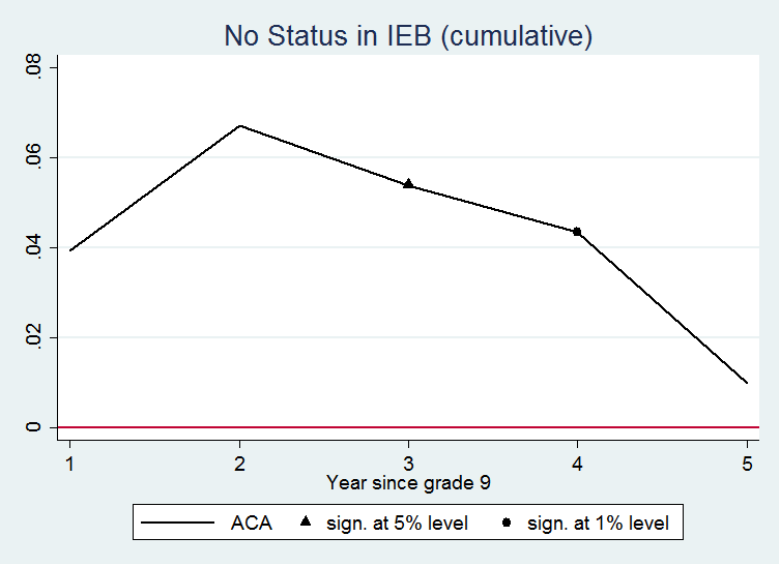
While we hardly find effect heterogeneity by gender in outcomes related to vocational training, treatment effect heterogeneity for males and females is considerably larger for cumulative labor market outcomes. Regarding unemployment, employment, and cumulative earnings males do not benefit from ACA. Men seem to drive the negative effects of ACA on unemployment, employment, and earnings.

4.4.3 The Role of Intermediate Outcomes

As discussed in Section 4.2 only a small share of lower track secondary school students enter vocational training directly after grade 9. The school-to-work transition is a dynamic process with intermediate steps before entering a vocational training and the labor market. Many school leavers delay the start of the vocational training either by choice or by lack of opportunity, i.e. that they do not get a vocational training position. We find some evidence for a delayed start of vocational training of ACA participants (see Figure 4.2). Fitzenberger and Lickleder (2017) find differences in educational outcomes for subgroups which could indicate that intermediate outcomes differ by ACA participation. Thus, we test whether intermediate outcomes are driving the effect of additional career assistance on medium-term labor market outcomes.

One might wonder whether the fewer days in employment and smaller cumulative earnings are due to the fact that ACA participants enter the labor market delayed, thus that there is simply no information available about them because they are still in school (which is not observed in the IEB data). To test this, we construct a variable indicating that there is no information on the individual's labor market status available in the administrative data up to a given year after grade 9. 13 % of the ACA participants do not show up in the administrative data up to year 3. Figure 4.7 shows the ACA effect on the unknown labor market status in the IEB over time. We find a positive effect of ACA on the probability to have no known status up to year 3 and 4 after school. The effect becomes significant in year 3 and 4 even though the size of the effect decreases after year 2. ACA participants are 5 pp more likely to have no status in the IEB up to year 3.

Figure 4.7: ACA Effect on Status Unknown in IEB over Time



Notes: Average marginal effects of Probit estimations, controls included, standard errors clustered by school, N=551.

The survey does provide some information on the status after grade 9, although the information needs to be taken with caution as it is not very reliable.[16] We can distinguish between participating in pre-vocational training[17], attending 10th grade of general schooling, or vocational school in a 2-year-program ('zweijährige Berufsfachschule'). Table 4.5 shows that ACA has a strong impact on the status after grade 9. Compared to doing a vocational training, ACA participants are 21.6 pp more likely to attend vocational school and 10.2 pp less likely to continue general schooling in grade 10.

For the analysis we only consider outcome variables that accumulate after the potentially unobserved time period, i.e. years 4, 5, and 6 after grade 9. By this time all programs

[16] The variable consolidates information based on the survey after school, information on the student's status provided by ACA staff and teachers, and plans during grade 9 (Fitzenberger and Lickleder, 2017). Information on vocational training and pre-vocational training provided by the employment agency found in the IEB are added as well.

[17] This includes both programs offered at vocational schools and other educational providers financed by the employment agency. While the former are usually not observed in the administrative data, the latter are observed. Most programs last up to a year.

Table 4.5: ACA Effect on Intermediate Outcomes

	ACA	
Status after grade 9 (Base category: vocational training)		
pre-vocational training	0.053**	(0.026)
10th grade general school	-0.102**	(0.041)
vocational school (2-year-program)	0.216***	(0.061)
other status	-0.145***	(0.020)
Observations	551	

Notes: Average marginal effects of ACA based on multinomial logit estimation. Controls equivalent to models in Table 4.A.1 included. Standard errors in parentheses, clustered by school. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

should be completed. Table 4.A.3 in the Appendix shows in Model (1) the ACA effect on the respective outcome in the years 4–6 as the baseline estimation. Model (2) shows the results of

$$y_{i,4/6} = \alpha + \beta T_i + \gamma\, unknownstatus_{i,3} + \theta X_i + u_i, \tag{4.7}$$

where $y_{i,4/6}$ is the cumulative employment, unemployment, or earnings of the years 4 to 6 after grade 9 and $unknownstatus_{i,3}$ is added to the model as an additional explanatory variable, indicating that the individual's status is unknown up to year 3.

In Model (3) we analyze heterogeneous effects by unknown status:

$$y_{i,4/6} = \alpha + \beta_1 T_i * \overline{unknownstatus}_{i,3} + \beta_2 T_i * unknownstatus_{i,3} + \gamma\, unknownstatus_{i,3} + \theta X_i + u_i, \tag{4.8}$$

where β_1 is the treatment effect for individuals whose status is known, whereas β_2 is the treatment effect for individuals, whose status is unknown up to year 3.

Finally, in Model (4) we check whether the type of status outside of the labor market affects the labor market outcomes and changes the estimate of the ACA effect.

$$y_{i,4/6} = \alpha + \beta T_i + \delta\, statusafter9_i + \theta X_i + u_i, \tag{4.9}$$

where $statusafter9_i$ is included as factor variable of the status after grade 9 as found in the survey data, with vocational training as base category.

The results in Table 4.A.3 in the Appendix show that the estimated ACA effects are generally robust to these changes in model specification. The coefficients of the unknown status variable are large and significant for all outcome variables (columns (2)). The point estimates of the treatment effect are slightly smaller (larger for unemployment), but remain significant. The analyses of heterogeneous effects in columns (3) show that the treatment effect seems to be driven by those ACA participants whose status is observed up to year 3. Their treatment effects are larger and significant while the ACA effect for those with unknown status is mostly insignificant. Finally, in columns (4) the type of status after grade 9 is added to the model specification. Here the ACA coefficients increase in size for all outcome variables and remain significant. The type of status after grade 9 does not impact the cumulative days in employment or unemployment in the years 4 to 6, but cumulative earnings. The causal interpretation of these results can only be made with caution because the status after grade 9 as intermediate outcomes could be regarded as "bad control" (Angrist and Pischke, 2009, pp. 64–68). Thus, we

Table 4.6: Robustness Check: ACA Effect After Excluding Distant Control Schools

	Start Voc. Training	Drop-out	Voc. qualif.	Apprent. wage	SES occup.	Prestige occup.	Days in unemploy.
Full sample							
ACA	-0.01	0.04	-0.05	-1.80*	0.31	-0.75	41.80***
	(0.05)	(0.03)	(0.05)	(0.92)	(1.10)	(0.82)	(9.47)
Observations	551	440	551	440	430	430	551
Sample without distant control schools							
ACA	-0.10***	0.10**	-0.10	-2.23*	-0.90	-2.10*	47.32***
	(0.04)	(0.04)	(0.08)	(1.11)	(1.77)	(1.04)	(7.21)
Observations	456	365	456	365	357	357	456

Notes: Average marginal effects of probit estimations for binary outcomes, OLS otherwise, controls equivalent to model in Table 4.A.1 included. Standard errors in parentheses, clustered by school. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

do not want to conclude that the ACA effect is indeed driven by those whose status is observed in the IEB, but it seems reasonable that intermediate outcomes are unlikely to be the driver of the observed ACA effects on cumulative employment, unemployment, and earnings.

4.4.4 Robustness Checks

The control group consists of five school in the surroundings of the city of Freiburg. Two of those control schools are located in Breisach am Rhein and Müllheim, the latter being 27 km away of Freiburg (see Figure 4.1). One could worry that the students at those two more distant control group schools differ too much from the treatment group to be a valid part of the control group. When students of those schools are a very positive selection within the control group, they would drive the observed negative treatment effects. By dropping observations of those two schools, we test whether this is the case. Table 4.6 shows that dropping those observations generally increases the treatment effect in the same direction of the effect with the full sample. There are some remarkable differences in the results, like the ACA effect on the probability to start a vocational training, which is large and significant. But as the point estimates indicate the same direction of the effect, it is unlikely that students of the more distant control schools drive the observed ACA effect, but rather seem to be more alike.

One might consider that the treatment effect is driven by the different local educational providers implementing ACA. There are in total five providers with different backgrounds: Some are related to churches, while others are private companies or funded by chambers of commerce. Both the organizational form, but probably mostly the different staff implementing ACA might lead to effect heterogeneity. Table 4.7 shows the previously examined outcome variables by different ACA providers[18] in Model 1. We can only identify provider 2 to lead to lower apprenticeship wage, socioeconomic status, and prestige of the vocational training occupation. Possibly, this is due a relatively higher probability to transition into a vocational training. This effect is however not significant. It seems unlikely that the providers are driving the respective effect of ACA.

[18]Two providers have been aggregated because one of them would have only represented one school.

Table 4.7: Robustness Check: ACA Effect by ACA Implementation

Reference: no ACA	Start Voc. Training	Drop-out	Voc. qualif.	Apprent. wage	SES occup.	Prestige occup.	Days in unemploy.
Model 1: ACA Provider							
ACA provider 1	-0.11	0.02	-0.03	-1.35	0.16	-0.02	38.84***
	(0.07)	(0.05)	(0.08)	(1.12)	(2.28)	(1.30)	(12.47)
ACA provider 2	0.05	0.08	-0.05	-2.95**	-4.58**	-4.84***	25.49*
	(0.04)	(0.06)	(0.07)	(1.03)	(1.93)	(1.24)	(12.06)
ACA provider 3	0.01	0.03	-0.05	-2.64**	1.89*	-0.83	44.11***
	(0.04)	(0.05)	(0.05)	(0.94)	(1.03)	(0.97)	(9.81)
ACA provider 4	-0.01	0.05*	-0.06	-0.78	-1.08	-0.41	41.81***
	(0.04)	(0.03)	(0.05)	(1.03)	(1.42)	(0.88)	(13.52)
Model 2: When took ACA place?							
ACA - teaching time	0.01	0.05	-0.05	-1.90*	0.35	-0.99	41.72***
(at least one year)	(0.04)	(0.04)	(0.05)	(1.01)	(0.96)	(0.87)	(10.46)
ACA - never	-0.12*	0.00	-0.03	-1.24	0.09	0.57	42.19***
during teaching time	(0.07)	(0.06)	(0.06)	(1.16)	(2.59)	(1.46)	(11.08)
Observations	551	440	551	440	430	430	551

Notes: Separate models for each ACA implementation, average marginal effects of probit estimations for binary outcomes, OLS otherwise, controls equivalent to model in Table 4.A.1 included. Standard errors in parentheses, clustered by school. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Another variation in the implementation of ACA is whether the ACA curriculum takes place during regular teaching time or after school. Regarding this, there are differences between schools and educational providers. The differences probably occur because of organizational issues on both sides, but might make a difference in the effectiveness of ACA. When ACA takes place after school, students need to be particularly motivated to participate and be engaged in the program. It might also be a signal for both the school's and educational provider's commitment to the program whether they made it possible that ACA took place during regular teaching time. We thus divide the treatment group by whether the ACA program takes place during regular teaching time, at least during one of the two school years, or whether ACA never takes place during teaching time. 21 % of the students in the treatment group never had ACA classes during regular teaching time. Table 4.7 shows the two different ACA effects in Model 2. We find only few effect differences: A lower probability to start a vocational training, when ACA never took place during teaching time, and a slightly lower apprenticeship wage, when ACA took place during school. Overall, it seems unlikely that this aspect of implementation of the treatment is driving the effectiveness of ACA. There is, for instance, no effect heterogeneity in the days of unemployment.

4.5 Conclusions

The program additional career assistance (ACA) was introduced as many other policy initiatives to improve school-to-work transitions of students whose starting position for the labor market is difficult. Our analysis shows that additional career assistance does not show positive effects on the labor market entry of its participants. The program improves neither the transition into nor the completion of vocational training within 6 1/2 years after grade 9. There is evidence for a delay of the start of the vocational training through ACA participation. Despite the delay, probably due to continued schooling or

pre-vocational training, additional career assistance does not lead to differences in the probability to drop out or the type of vocational training with regard to wages, socioeconomic status, or prestige. In the medium term, ACA decreases time in employment and earnings of its participants and increases the time spent unemployed within the first six years after leaving school. Those effects on labor market outcomes develop over time and become larger and significant starting in year 4 after grade 9. Thus they can at most partly be attributed to the delayed start of vocational training. Analyzing the role of intermediate outcomes shows that a delay by continued general or vocational schooling is unlikely to drive the negative treatment effects. Examining heterogeneous effects we find that treated males drive the negative treatment effects on labor market outcomes in the medium term. There is only little heterogeneity in the effects by migratory background.

These unintended effects of additional career assistance might come at a surprise. But there are hints in the literature that is important for the effectiveness of career guidance interventions to target them well (McNally, 2016). The effects can possibly be explained by the information overload that students are confronted with in the context of career planning. In an environment of already available career guidance activities, like the career orientation curriculum in school and the information and counseling service provided by the employment agency, ACA adds even more career guidance activities. In a context of unrealistic educational aspiration and overconfidence ACA seems not to be able to reduce choice avoidance and help form realistic aspirations. Finding mostly significant treatment effects in the medium term, these results stress the importance of evaluate career guidance programs beyond the short-term effects.

Thus we can support McNally (2016) in her reasoning that tailoring career guidance, particularly for disadvantaged students, is a challenge for successfully supporting career planning and school-to-work transitions. While we are able to study a longer time span than most evaluations of career guidance activities we need to point out that we do not know whether the effects are lasting in the long run. It is still possible that ACA participants catch up later and the negative effects fade out with longer labor market participation.

4.A Appendix

Table 4.A.1: Full Models – ACA Effect on Labor Market Entry

	Start Voc. Training	Drop-out Voc. Training	Completed Voc. Qualif.	Apprent. wage	Av. wage training occ.	SES training occ.	Prestige training occ.	Days unemploy-ment	Days apprent./ employ.	Days ALMP programs	Cumul. Earnings
ACA	-0.01	0.04	-0.05	-1.80*	4.01	0.31	-0.75	41.80***	-124.49**	30.73	-6741.51***
	(0.05)	(0.03)	(0.05)	(0.92)	(42.22)	(1.10)	(0.82)	(9.47)	(48.14)	(42.30)	(1872.67)
Gender: Female	0.01	0.07**	0.03	-3.67***	-672.67***	4.51***	3.47***	13.34	-39.00	-18.81	-7324.89***
	(0.02)	(0.03)	(0.05)	(0.80)	(65.71)	(1.13)	(1.02)	(9.35)	(60.64)	(15.84)	(2406.21)
Migratory background	-0.08***	-0.08**	-0.06	1.70**	115.93**	2.81**	2.61***	-11.35	-59.36	33.34	770.45
	(0.03)	(0.04)	(0.04)	(0.71)	(41.37)	(1.04)	(0.78)	(10.45)	(52.35)	(26.72)	(2160.57)
cohort 1	0.03	-0.11**	0.07	-0.85	1.87	0.82	0.86	-21.54*	-123.70	6.34	-9511.58***
(grade 9 in 08/09)	(0.06)	(0.05)	(0.04)	(0.98)	(66.54)	(1.13)	(0.91)	(10.28)	(73.96)	(21.87)	(3073.06)
Father's school qualification:	-0.02	0.01	-0.05	-0.22	20.57	-0.10	-0.11	-12.59	-110.91	-44.19	-3174.84
middle track or higher	(0.05)	(0.04)	(0.04)	(0.58)	(28.48)	(1.02)	(0.63)	(12.54)	(66.51)	(30.67)	(2932.08)
Migrant share in residential area (Reference: 10 % and less)											
11 %- 20 %	-0.04	0.01	-0.15***	1.47*	28.17	1.81**	0.18	-11.52	-187.65***	-14.17	-7246.97**
	(0.02)	(0.02)	(0.03)	(0.80)	(47.51)	(0.77)	(0.73)	(10.88)	(42.19)	(29.90)	(2636.98)
more than 20 %	-0.06	0.03	-0.13	2.56*	42.08	1.16	-0.86	-19.60	-169.80	44.45	-5458.97
	(0.06)	(0.05)	(0.09)	(1.29)	(85.78)	(2.46)	(1.34)	(14.84)	(109.18)	(28.21)	(4277.76)
School offers grade 10	-0.04	-0.03	-0.00	0.07	-11.09	0.51	-0.89	-4.91	-82.48*	-46.43	425.30
	(0.03)	(0.03)	(0.03)	(0.79)	(41.22)	(1.12)	(0.97)	(6.52)	(46.06)	(31.80)	(1962.71)
Additional classes (AC)	-0.07**	-0.03	-0.04	1.98*	131.50	3.81***	2.10*	-16.18	-107.19	-81.27**	-5055.46*
	(0.03)	(0.05)	(0.07)	(0.96)	(78.05)	(1.23)	(0.99)	(12.26)	(75.43)	(36.03)	(2823.33)
GPA (German/Math)	-0.05	-0.03	0.01	-1.36**	-70.42	-1.85	-1.16	31.48**	11.43	27.28	-349.16
grade 7	(0.03)	(0.04)	(0.04)	(0.52)	(53.57)	(1.37)	(0.75)	(10.88)	(45.13)	(31.75)	(1704.34)
Teacher: Individual	0.01	0.07	-0.07	-0.59	-54.76	-0.98	-0.25	0.31	-118.75	104.20***	-5969.32
talk desirable	(0.06)	(0.07)	(0.08)	(0.92)	(73.99)	(1.78)	(1.12)	(16.30)	(96.53)	(24.16)	(3709.91)
Teacher: non-cognitive	-0.02	-0.05***	0.01	-0.01	85.76**	0.66	-0.39	-7.34	-23.37	-0.09	-996.85
skills	(0.03)	(0.02)	(0.03)	(0.58)	(38.19)	(0.70)	(0.53)	(7.98)	(31.99)	(21.40)	(1644.70)
Constant				25.65***	3015.90***	32.70***	40.64***	-19.71	1472.67***	94.22	62255.02***
				(2.15)	(181.40)	(4.50)	(2.32)	(33.57)	(156.78)	(124.49)	(6766.89)
Observations	551	440	551	440	430	430	430	551	551	551	551
R^2				0.13	0.36	0.19	0.16	0.07	0.07	0.08	0.09

Notes: Full models corresponding to the treatment effects shown in Table 4.4. Average marginal effects in first three columns of probit estimations, OLS otherwise.
Controls for imputed variables included. Standard errors in parentheses, clustered by school. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Estimation on apprent. wage with restricted sample (N = 430, without missing in occupation) yields slightly smaller point estimate (-1.53 (0.93)).

Table 4.A.2: Heterogeneous ACA Effects on Labor Market Entry

	Start Voc. Training	Drop-out Voc. Training	Completed Voc. Qualif.	Apprent. wage	Av. wage training occ.	SES training occ.	Prestige training occ.	Days unemploy-ment	Days apprent./ employ.	Days ALMP programs	Cumul. Earnings
Model 4.5: Migratory Background											
ACA*no migratory background	-0.02	0.03	-0.06	-1.71	31.32	0.56	-0.76	45.73***	-153.47***	40.05	-6553.93***
	(0.05)	(0.04)	(0.05)	(0.99)	(50.47)	(1.28)	(1.01)	(10.01)	(51.98)	(46.61)	(1832.51)
ACA*migratory background	0.01	0.08	-0.01	-2.05	-65.11	-0.33	-0.72	32.69**	-57.23	9.11	-7176.76
	(0.05)	(0.07)	(0.08)	(1.36)	(59.01)	(1.24)	(1.15)	(14.46)	(99.32)	(57.28)	(4412.97)
Model 4.6: Gender											
ACA*male	0.00	0.07	-0.05	-2.03	23.21	0.31	-1.19*	51.28***	-149.07**	41.18	-8267.09***
	(0.05)	(0.04)	(0.05)	(1.17)	(64.80)	(1.33)	(0.62)	(11.27)	(63.43)	(49.83)	(2685.60)
ACA*female	-0.03	0.02	-0.05	-1.52	-20.51	0.30	-0.18	29.76*	-93.28	17.46	-4804.93
	(0.07)	(0.07)	(0.12)	(1.89)	(68.81)	(1.86)	(1.78)	(14.59)	(102.84)	(35.96)	(3846.94)
Observations	551	440	551	440	430	430	430	551	551	551	551

Notes: Two separate models for each treatment interaction type, reference group is the respective subgroup without ACA, controls included.
Average marginal effects in first three columns of probit estimations, OLS otherwise. Standard errors in parentheses, clustered by school * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4.A.3: Effects of ACA and Intermediate Outcomes on Labor Market Outcomes

	Days in apprent./employment year 4–6				Days in unemployment year 4–6				Cumulative Earnings year 4–6			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
ACA	-95.39**	-69.79**		-115.07**	34.66***	36.09***		44.29***	-5526.54***	-4489.74***		-5875.14***
	(35.77)	(31.19)		(41.56)	(10.00)	(9.86)		(10.88)	(1405.74)	(1386.25)		(1626.93)
ACA*status known year 1–3			-75.35*				37.12***				-4714.41**	
			(37.16)				(10.68)				(1815.62)	
ACA*status unknown year 1–3			-18.42				26.55**				-2414.55	
			(65.69)				(10.18)				(5417.81)	
status unknown year 1–3		-531.87***	-577.05***			-29.69**	-21.30**			-21534.42***	-23359.58***	
		(30.28)	(84.77)			(10.88)	(9.67)			(2036.36)	(6634.74)	
Status after grade 9 (Reference: vocational training)												
pre-voc. training				-80.91				7.00				-18371.89***
				(78.53)				(18.76)				(3625.02)
general school				-129.04				8.58				-19055.39***
10th grade				(76.53)				(19.19)				(4074.90)
vocational school				-79.16				-9.80				-16728.80***
(2-year-program)				(71.99)				(20.11)				(3616.53)
other status				-172.26*				38.98				-19552.66***
				(87.50)				(26.12)				(4803.36)
Observations	551	551	551	551	551	551	551	551	551	551	551	551
R-squared	0.04	0.17	0.17	0.05	0.06	0.06	0.06	0.07	0.08	0.17	0.17	0.14

Notes: OLS estimations. Comparison groups in columns (3) are the respective subgroup without ACA. Controls equivalent to model in Table 4.A.1 included. Standard errors in parentheses, clustered by school. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4.A.4: Placebo Pretreatment Final Grades in grade 7

	(1)	(2)	(3)	(4)	(5)	(6)
ACA	-0.06	-0.09	-0.13*			
	(0.14)	(0.08)	(0.07)			
ACA*migratory background				-0.09	-0.18**	-0.18**
				(0.16)	(0.07)	(0.07)
ACA*no migratory background				-0.09	-0.06	-0.11
				(0.15)	(0.10)	(0.08)
Migratory background	no	yes	yes	yes	yes	yes
Other controls	no	yes	yes	no	yes	yes
Non-cognitive skills	no	no	yes	no	no	yes
Observations	551	551	551	551	551	551

Notes: Other controls include: gender, family background, characteristics of residential area, school characteristics. Standard errors in parentheses, clustered by school. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4.A.5: Placebo Pretreatment Non-cognitive Skills (Teacher's Assessement)

	(1)	(2)	(3)	(4)	(5)	(6)
ACA	0.03	0.02	0.02			
	(0.06)	(0.06)	(0.06)			
ACA*migratory background				0.03	-0.03	-0.04
				(0.08)	(0.08)	(0.08)
ACA*no migratory background				0.05	0.05	0.05
				(0.06)	(0.06)	(0.06)
Non-cognitive skills	no	yes	yes	yes	yes	yes
Final grades	no	yes	yes	no	yes	yes
Other controls	no	no	yes	no	no	yes
Observations	551	551	551	551	551	551

Notes: Other controls include: gender, family background, characteristics of residential area, school characteristics. Standard errors in parentheses, clustered by school. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4.A.6: Placebo Pretreatment Attending Additional Classes

	(1)	(2)	(3)	(4)	(5)	(6)
ACA	0.03	0.02	0.02			
	(0.06)	(0.06)	(0.06)			
ACA*migratory background				0.03	-0.03	-0.04
				(0.08)	(0.08)	(0.08)
ACA*no migratory background				0.05	0.05	0.05
				(0.06)	(0.06)	(0.06)
Non-cognitive skills	no	yes	yes	yes	yes	yes
Final grades	no	yes	yes	no	yes	yes
Other controls	no	no	yes	no	no	yes
Observations	551	551	551	551	551	551

Notes: Other controls include: gender, family background, characteristics of residential area, school characteristics. Standard errors in parentheses, clustered by school. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

5 Transitions from Lower Track Secondary Schools into Vocational Education: Does a Detour Pay Off? *

5.1 Introduction

The gold standard for a smooth school-to-work transition of German lower track secondary school students is the direct transition into vocational training after grade 9.[1] Direct transition quotas are, for instance, the main measure of success in evaluations of career guidance activities. Hence, the fact that only a minority of students from lower track schools manage to transition directly into vocational training after leaving school (Gaupp et al., 2008; Menze and Holtmann, 2019), has been a concern to employers, educators, and politicians. Even though it is not clear a priori that is indeed a problem. Alternative pathways include continuing general schooling or going to vocational schools in order to upgrade the secondary school qualification, or participating in pre-vocational training. Those detours are a worthwile investment when adolescents have higher aspirations and are able to accomplish those by, for instance, upgrading their secondary school qualification. For others, pre-vocational training might help to compensate perceived and observed shortfalls of skills necessary for vocational training (Kohlrausch and Solga, 2012; Protsch, 2014). However, other reasons for a detour like the failure to secure a vocational training position or avoidance of the complex decision of occupational choice might not lead to the desired effects. There remains the concern that adolescents might waste their time or even worsen their situation on the vocational training market by being subject to stigma (Beicht, 2009).

This paper analyzes the effect of alternative transition paths after grade 9 of lower track secondary school on the type of vocational training. I contribute to the literature by studying outcomes beyond the transition probability into vocational training. I analyze differences in match quality, drop-out probability, and level of satisfaction with the vocational training as well as wages, prestige, and socioeconomic status of the training occupation. These outcomes are compared for the direct transition as well as the delayed transitions into vocational training due to the continuation of general schooling, attendance of vocational school, or participation in pre-vocational training.

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[1] The German three-tier secondary school system is traditionally supposed to prepare students in the lower track ("Hauptschule") until grade 9 for vocational training in crafts, trades, and service occupations with moderate to low requirements. Students in the middle track ("Realschule") are also prepared for vocational training, but remain in school until grade 10 and thus qualify for more complex occupations. Upper track secondary schools ("Gymnasium") prepare for higher education until grade 12 or 13, but they may also enter vocational training after graduation.

Studies on the effectiveness of pre-vocational training have mostly focused on the probability to transition into vocational training. Programs that allow to reach a higher secondary school qualification are correlated with a higher probability to transition into vocational training (Beicht, 2009; Enggruber and Ulrich, 2014; Solga, 2004), but the transition is often delayed (Schuchart, 2011). If there are positive correlations, they are mostly driven by high-performing students (Menze and Holtmann, 2019). Rahn et al. (2017) show that lower track secondary school students participating in different 1-year-programs are not more likely to start vocational training. Within the pre-vocational training programs that do not provide the option of upgrading the secondary school qualification, programs where students spend more time within firms are positively related to the transition into vocational training (Achatz et al., 2012; GIB/IAB, 2012; Menze and Holtmann, 2019). So far the existing evidence suggests that pre-vocational training does not foster the development of skills (Nickolaus et al., 2018; Weißeno et al., 2016). The literature above does not allow a causal effect interpretation, as they cannot account for selection into pre-vocational training. Kübler et al. (2019) find in an experimental audit study that employers prefer applicants who voluntarily participated in a pre-vocational training over those only working in an informal job. While the design of the study allows causal interpretation, the transferability of the results on Germany in general is questionable. Berlin is the only state that does not have compulsory schooling until 18 and thus selection into pre-vocational training is likely to differ from other states. Caliendo et al. (2011) find a positive effect of pre-vocational training on the transition in vocational training for unemployed youth, however, no effect on employment probability within five years after program entry.

While most of the literature analyzes the determinants of the probability to start a vocational training, there is only little evidence on the determinants of the type of vocational training or occupation. Studies show that students with higher school qualification levels, better math grades as well as females enter more prestigious occupations (Beicht and Walden, 2014; Schuchart, 2007). Continuing general schooling is associated with a superior vocational training occupation conditional on a transition into vocational training (Geier et al., 2011; Schuchart, 2011). The level of satisfaction with the vocational training after a direct or a delayed transition is comparable while it is slightly worse after a delayed transition (BiBB, 2018, pp. 257), however, these results are only based on descriptive statistics.

This paper shows that a delayed transition into vocational training after lower track secondary school is not a disadvantage conditional on a successful transition into vocational training. Using the comprehensive survey data NEPS I account for selection on a wide range of observables into the different transition paths. Students benefit from continuing general schooling or attending vocational school compared to transitioning directly with regard to wages paid during vocational training as well as average wages, prestige, and socioeconomic status of the training occupation. This comes at the cost of a lower probability to match the training occupation with the reported desired occupation and being less satisfied with the vocational training. Attending vocational school before the vocational training makes dropping out of vocational training more likely. Participation in pre-vocational training does not lead to a different type of vocational training position compared to a direct transition. However, those participants are less satisfied with their vocational training.

The paper is organized as follows: Section 5.2 introduces relevant institutions of school-to-work transitions, Section 5.3 describes the data and the selection into transition paths, Section 5.4 provides expectations, and Section 5.5 explains the empirical ap-

proach. The results including the analysis of heterogeneous effects, mechanisms, and robustness checks are presented in Section 5.6, Section 5.7 concludes.

5.2 Institutions of School-to-Work Transitions of Lower Track Secondary School Students

Traditionally, the lower track of the German three-tier secondary school system means to prepare students for a vocational training after leaving school at the end of grade 9.[2] Upon successfully completing grade 9, they receive the lower track secondary school qualification ("Hauptschulabschluss" or equivalent), which has been sufficient for many apprenticeship occupations. However, with larger share of secondary school students graduating with a higher education entrance qualification ("(Fach-)Hochschulreife") and still entering the vocational training market (Bonin, Fitzenberger, et al., 2016) as well as vocational training of many occupations becoming more complex (Protsch, 2014), the direct transition into vocational education has become rarer for lower track secondary school students. Policy reactions to this development have been observed with regard to education and labor market policy. Education policy is in state responsibility, while labor market policy is in federal responsibility.

Most states have expanded in different ways the possibilities for lower track students to reach a middle track secondary school qualification ("Mittlere Reife") and thus upgrade their secondary school qualification. Most expanded lower track secondary schools' grade range up to grade 10. While this has become the most common path for lower track students in some states, access to this option is more restricted in other states. Some states have even eliminated the lower track altogether and aggregated lower and middle track secondary school going until grade 10. Alternatively, states offer more programs at vocational schools that reward the middle track secondary school qualification. Those programs usually entail also vocational education curriculum in several occupational fields.

In the context of this paper, a student has an upgraded school qualification whenever it is higher than a lower secondary school qualification, i.e. a qualifying lower secondary school qualification ("qualifiziernder Hauptschulabschluss") or middle track secondary school qualification ("Mittlere Reife"). In some states the qualifying lower secondary school qualification can also be reached when graduating from grade 9 with very good grades. It shows that the graduate is qualified for the continuation of general schooling in grade 10. The middle track secondary school qualification requires at least 10 years of schooling and can be reached both at general and vocational schools.

A wide range of pre-vocational training programs are offered to students that do not have the potential to reach a higher secondary school qualification, but are not or do not feel ready to start a vocational training. Only very few 9^{th} grade students participate in pre-vocational training by choice but rather by lack of alternatives.[3] In this case, school-leavers have to participate in pre-vocational training because most states have compulsory schooling until age 18, which can be fulfilled either at general schools or vocational schools (full-time or part-time schooling during an apprenticeship) (Vossenkuhl, 2010).[4]

[2] In this system, middle track secondary school, lasting until grade 10, also prepares for vocational education and upper track secondary school, lasting until grade 12/13, prepares for higher education.

[3] When surveyed in grade 9, only 4 % of students in my sample expected to participate in pre-vocational training after leaving school.

[4] Only Berlin does not have compulsory schooling until age 18, but requires ten years of schooling.

Hence, selection into pre-vocational training is likely to be negative. In 2014 roughly 253,000 young individuals started a pre-vocational training program (Statistisches Bundesamt, 2015). Pre-vocational training programs are instruments both of federal youth labor market policy and states' education policy. Thus they are offered at vocational schools or by private educational providers financed by the employment agency (as active labor market policy program). They entail general schooling, vocational education, and work experience placements. They neither offer a vocational qualification nor general school qualification. Here, students are supposed to be prepared for vocational training whenever skills are missing and they have not found an apprenticeship position.

Transition into vocational training involves the choice among over 300 apprenticeship occupations and timely applications. Most of the students enter vocational education by a firm-based apprenticeship with part-time vocational schooling, in my sample this makes up 80 %. The recruiting process for apprenticeships is equivalent to recruiting for other jobs, thus the individuals compete for apprenticeships posted by employers. Occasionally, employers (mostly in rural areas) are pushed by the general public to increase the supply of apprenticeships if there are too many students who would like to start an apprenticeship and who would otherwise not be able to. Vocational training for some occupations are full-time school-based, for instance nurse and nursery/kindergarten teachers. Admission for school-based vocational training are mostly based on prior academic achievement.

5.3 Data and Selection into Transition Paths

5.3.1 Data

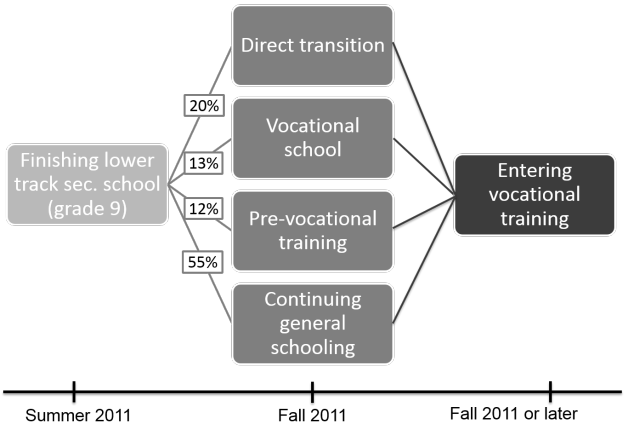
The starting cohort 4 of the National Educational Panel Study (NEPS) is used to examine the effect of different transition paths on the type of vocational training (Blossfeld et al., 2011).[5] The survey of this NEPS cohort starts with grade 9 in 2010 in all three tracks of secondary school. Students are surveyed as long as possible in the classroom context and followed individually after leaving school via at least yearly CATI interviews. For this paper, only observations of students of the lower track of secondary school or equivalent types of secondary school are used. It is possible to follow the students up to four years after grade 9.

The transition path is determined based on the individual's status in fall 2011 right after finishing grade 9 of lower track secondary school (see Figure 5.1). The sample consists of 3,730 individuals for whom the transition path in fall 2011 is known. The individuals either use the traditional path of transitioning directly in vocational training (20 %), attend vocational school (13 %), participate in pre-vocational training (12 %), or continue general schooling at the school where they started secondary school (55 %).[6]

[5] Data used from the National Educational Panel Study (NEPS): Starting Cohort Grade 9, doi:10.5157/NEPS:SC4:9.1.1. From 2008 to 2013, NEPS data was collected as part of the Framework Program for the Promotion of Empirical Educational Research funded by the German Federal Ministry of Education and Research (BMBF). As of 2014, NEPS is carried out by the Leibniz Institute for Educational Trajectories (LIfBi) at the University of Bamberg in cooperation with a nationwide network.

[6] The distribution of transition types is likely to be slightly biased by panel attrition as students leaving school need to be followed individually. The share of students remaining at general schools is likely to be overrepresented in the sample, while direct transition, pre-vocational training, and vocational school are probably underrepresented. As we control for background characteristics relevant for panel

Figure 5.1: Scheme of Transition Paths after Grade 9



The continuation of general schooling is the most frequently chosen option. This requires that the educational system of the state and the school allows for this option. Going to a vocational school means in this context that the student participates in a program that offers the completion of the middle track secondary school qualification, but does not award a vocational qualification. However, the programs usually include a vocational curriculum in an occupational field. Pre-vocational training programs can also take place at vocational schools, but they neither offer a general school qualification (middle track or higher) nor a vocational qualification, but are designed to prepare for vocational training and increase trainability.[7] Pre-vocational training and programs at vocational schools are treated as common group of programs in the 'transition system' ("Übergangssystem") in reporting on education (see e.g. Autorengruppe Bildungsberichterstattung, 2014). However, they differ both in participants and outcomes and thus are treated as separate transition paths here.

The analysis is focused on those individuals who start vocational training at some point in the observed time span, i.e. 2,779 individuals.[8] The aim is to assess differences in the started vocational training, hence the following outcomes variables are considered: matching quality of training occupation, stability of the vocational training measured by drop-out probability within the first year, level of satisfaction with the vocational training, starting wage in vocational training and a number of occupation-based information on the vocational training. Those are the socioeconomic status, the prestige, and average wage of vocational training occupation.[9] The socioeconomic status of the training occupation is measured with the ISEI-08 score developed by Ganzeboom (2010) and Ganzeboom, Graaf, et al. (1992). It maps occupations in a range of 11.56 to 88.96 in a combination of level of education and income. Prestige of occupation of vocational training is measured with the SIOPS-08 score developed by Ganzeboom and Treiman (2003) and Treiman (1977). It ranges from 0 to 100 and is a prestige ranking based on surveys from 55 countries. Average wage of occupation of vocational training is the aver-

attrition in the estimations, this should not bias the results (Steinhauer and Zinn, 2016). Nonetheless, the robustness of the estimations results to sample selection issues is tested in Section 5.6.3.

[7] Table 5.A.1 describes the programs that are observed in the sample.

[8] As the selection into a vocational training is not random, this selection issue is discussed in Section 5.6.3.

[9] Detailed description in Table 5.A.2 (in Appendix).

age monthly wage before tax in 2010, matched on the occupation of vocational training in East/West-gender-occupation-cells using the occupation classification KldB2010.

The outcome variables are listed in Table 5.1 including the sample mean and standard deviation as well as means by transition type. 36 % of the sample matched the vocational training with their desired occupation in grade 9. However, the difference by direct transition and detour is large: 61 % match desired and training occupation after a direct transition into vocational training. They also drop out less often within in the first year (25 %), below the sample mean of 30 %. The ISEI-08 score for socioeconomic status of the training occupation averages at 34.77, below the score of 37 which has been determined to represent occupations that are mostly occupied by individuals having reached at least a middle track secondary school qualification (Schuchart, 2011). While skilled manual workers (mostly craft workers, some skilled service, and skilled machine operators) reach an average ISEI score of 36, semi-unskilled workers (mostly machine operators, elementary laborers, elementary sales and services) reach an average ISEI score of 31 (Ganzeboom and Treiman, 1996). Individuals attending vocational school enter vocational training positions with the highest average score of 37.64, above the threshold for middle track school qualification, while participants of pre-vocational training and individuals transitioning directly share the lowest socioeconomic status of their training occupation at 31.29. The prestige score SIOPS-08 averages at 40.23 over the sample with a smaller standard deviation. Individuals attending vocational school again have the highest score of 41.74 in their training occupation. The starting wage during the vocational training averages at 467 Euros (monthly wage after tax), with individuals following a direct transition into vocational training earning the least with 428 Euros per month. The individuals in the sample enter training occupations with average wages of 2728 Euros, with participants of pre-vocational training programs having the lowest average at 2647 Euros. Finally, the level of satisfaction with the vocational training reaches a mean of 8.08 (in a Likert scale of 1 to 10, with 10 being entirely satisfied). Here, individuals transitioning directly into vocational training are the most satisfied with an average of 8.53.

Table 5.1: Descriptive Statistics of Outcome Variables by Transition Type

	Total Mean	Total Std.	Pre-voc. training	Voc. school	Gen. school	Direct transition	Obs.
Match desired/ voc. training occupation	0.36	0.48	0.27^{***}	0.29^{**}	0.27^{***}	0.61^{***}	2190
Drop-out of voc. training within first year	0.30	0.45	0.34^{*}	0.34	0.30	0.25^{***}	2779
SES of voc. training occupation (ISEI-08)	34.77	11.82	31.29^{***}	37.64^{***}	36.66^{***}	31.29^{***}	2702
Prestige of voc. training occupation (SIOPS-08)	40.23	7.73	38.35^{***}	41.74^{***}	41.04^{***}	38.78^{***}	2702
Starting wage in vocational training	467	155	445^{**}	509^{***}	483^{***}	428^{***}	2165
Average wage of voc. training occupation	2728	606	2647^{**}	2827^{***}	2761^{***}	2659^{***}	2694
Level of satisfaction with voc. training	8.08	1.53	7.54^{***}	7.72^{***}	7.96^{***}	8.53^{***}	2303

Notes: See Table 5.A.2 (in Appendix) for description of the outcome variables. Stat. significant difference relative to all three other groups: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Summarized, we observe that after a direct transition in vocational training individuals

are more likely to have matched the training occupation with their desired occupation, are less likely to drop out within the first year, and are more satisfied. A transition through vocational school is associated with the highest wages, prestige, and socioeconomic status of the training occupation, closely followed by the continuation of general schooling. Participation in pre-vocational training is associated with similar levels of wages, prestige, and socioeconomic status as the direct transition.

As the descriptive differences in the means might be biased by selection into the transition path, the comprehensive survey data of the NEPS is used. Besides the standard personal and family background characteristics, like gender and migratory background, also health status (Beicht and Walden, 2014) and socioeconomic status of mother's and father's occupations (Geier et al., 2011) are available. I use final grades in German and Math of grade 9 as well as results of competence tests in math, reading, perceptual speed and more. By this, I control both for the by the employers observed skill level (grades) and measures for ability (cognitive skills). Non-cognitive skills and personality traits have shown to be relevant for the school-to-work transition (Kohlrausch and Solga, 2012; Protsch and Dieckhoff, 2011) and, hence, are included in the analysis. The advancement of career planning in grade 9 probably influences the likelihood to transition directly in vocational training because the delay might be due to choice avoidance. It can also affect the type of vocational training and thus is included in the analysis. Socioeconomic status of the reported desired occupation and level of life satisfaction in grade 9 are used to control for differences in the default levels of the outcome variables. Level of life satisfaction in grade 9 is only included in the model for level of satisfaction with the vocational training. Career guidance activities affects transition choice and might as well affect the type of vocational training, assuming that they influence the decision quality (Fitzenberger, Hillerich-Sigg, et al., 2020; Fitzenberger and Lickleder, 2017; Solga and Kohlrausch, 2013). Application behavior is included as well, the only control variable that is measured both during and after grade 9, because those already planning to postpone the vocational training start applying later. School and class characteristics are included as well, as there are considerable differences on these levels in terms of additional career guidance, institutions, and class composition that might be relevant for the school-to-work transition (Fitzenberger, Hillerich-Sigg, et al., 2020). The share of students with a particular transition path is highly correlated with the state as the state's education policy determines, for example, the availability of programs at vocational schools or grade 10 at lower track secondary schools. Thus, I control for the type of state the individual went to school. Finally, local labor market characteristics are known to be highly relevant for school-to-work transitions (Riphahn, 2002). Kleinert and Kruppe (2012) describe 12 apprenticeship market types across Germany, which I use as dummy variables. All variables, including variable descriptions, are listed in Table 5.A.2 (in Appendix). I use imputation methods for missing control variables to prevent loosing too many observations. The imputation methods used are described as well in Table 5.A.2 for each variable. Controls for imputed variables are included in the estimations.

5.3.2 Selection into Transition Paths

In order the identify relevant determinants of the selection into transition paths I use a multinomial logit model. The average marginal effects with the direct transition as base category are shown in Table 5.A.3 (in Appendix). There are differences between transition paths regarding age, gender, and migratory background: Participants of pre-vocational training are older and those continuing general school are younger than those

transitioning directly. Men are less likely to go to school (both general and vocational) while a migratory background increases the probability to participate in pre-vocational training.

Students with worse grades in Math and German are more likely to participate in pre-vocational training than transiting directly in vocational training. Worse grades reduce the probability to attend vocational school, while general schooling and direct transition do not differ in academic achievement. With regard to cognitive skills, reading and math competences are the most relevant for the transition path. Students with better reading skills are more likely to continue schooling (either vocational or general) than transitioning directly in vocational training. Higher math skills are negatively related to participating in pre-vocational training and attending vocational school, and positively related to continuing general school.

Personality traits, measured by the Big Five, are not relevant for the selection in transition paths. The self concept how the students see their skills in German, Math, and generally in school are more relevant. Particularly, the self concept on school influences the transition decision. Students with a high self concept on school are less likely to participate in pre-vocational training and more likely to continue general school. A higher self concept on Math increases the probability to continue general school. Prosocial behavior makes it less likely to continue schooling than transitioning directly in vocational training. Students, who describe their career planning to be advanced, are less likely to attend vocational school (compared to those transitioning directly). A work experience placement, which was helpful for career planning, and counseling by the employment agency, decreases the probability to continue general schooling and increases the probability of directly starting vocational training.

School and class characteristics are only relevant for the selection into some transition paths. Students are more likely to continue general schooling when their school offers grade 10 and when this transition path is very common across the state. Local labor market types play an important role in the selection into different transitions. In rural Eastern German regions with few students, high unemployment, and average market tightness students are more likely to participate in pre-vocational training and less likely to attend vocational schools. The latter is true for all Eastern German regions. Vocational schools are a more frequent choice in most Western German regions (even compared to the Western German reference group).

In order to assess the explanatory power of the model, the estimations are repeated with linear probability models using dummies for each transition path as outcome variable (Table 5.A.4 in Appendix). Marginal effects of the logit estimation and the coefficients of the linear probability model estimations are comparable in size and direction. The R^2 ranges from 0.10 to 0.41 with the transition into general school and direct transition being best explained by the model. When adding the variables stepwise to the estimation, school grades add the largest explanatory power (not shown).

Overall, it these results give the impression that there is a negative selection with regard to school grades into pre-vocational training and a positive selection into vocational schools. With regard to math competencies the positive selection is directed towards general schooling, whereas pre-vocational training and vocational school are similarly negatively selected compared to direct transitions. Career guidance activities reduce the probability to continue schooling. Students with advanced career planning are less likely to attend vocational school. However, factors beyond individual characteristics like the state's education policy and local labor market characteristics are also significant

determinants.

5.4 Theoretical Considerations

Given the market situation the students face when applying for most vocational training positions, labor market theories can be applied to form hypotheses on the effect of the different transition paths on the type of vocational training.

Classical human capital theory expects that any kind of prolonged schooling would increase human capital and hence productivity (Becker, 1993). In a framework involving training costs, previously achieved levels of education prove the trainability of an applicant (Thurow, 1972). This should lead to an improved position in the applicants' pool and open up opportunities to higher paying occupations or occupations of more prestige. Thus, lower track secondary school students would benefit from continuing general schooling, but also from participating in pre-vocational training or vocational schooling over transitioning directly into vocational training. A ranking between general schooling and vocational education is not clear ex ante and might depend on the match of occupational field of the pre-vocational training and the vocational training occupation. If the student can accumulate occupational knowledge matching the future vocational training occupation they would have improved their productivity. Otherwise, we do not expect differences in the effect of the different types of continuation of schooling.

Expectations from job search models (e.g. Mortensen and Pissarides, 1999) are ambiguous. On the one hand, students who transition directly into a vocational training have had a shorter job search period and are thus less likely to find a good match, e.g. with regard to wages and status. On the other hand, transitioning directly into vocational training might indicate a more advanced career planning and higher search effort during grade 9. Whether the longer search period or higher search effort is more effective is an empirical question.

Regarding the effect of a detour after grade 9, we have to consider the reasons why students might choose a different path after grade 9. The first reason might be that students realized during their career planning that they have higher aspirations and that the lower track secondary school qualification is not sufficient for their desired occupation. Thus they plan an educational upgrading of their secondary school qualification by either continuing general school or by attending vocational school. They would then benefit from the longer search period and thus are more likely to face a larger variety of apprenticeship offers. This would result in a vocational training position of higher quality. It is also likely that those individuals are more satisfied with their vocational training as they realized their career plan.

An alternative reason for the same transition path of educational upgrading would be if students want to enter a vocational training, but are unsuccessful in securing a vocational training position in the desired occupation. Here, the extended search period could allow them to realize their originally planned vocational training position or adjust their plans and thus show positive effects on the type of vocational training. In the case of readjustments of career plans the desired and realized occupation will not match anymore and this might lead to lower levels of satisfaction.
For students who are less advanced in their career planning it seems likely that they continue general schooling as the easiest, most salient option. Thus educational upgrading is more a result of choice avoidance than intentional career planning. According to search

theory, after the additional school year they might be more able to make a occupational decision and feel less uncertainty regarding a vocational training. However, they probably benefit less from the additional time than those making the intentional decision. Other individuals might opt for the vocational school also due to choice avoidance regarding a vocational training, but might consider the vocational school as an interim solution between continuing general school and vocational training. Additionally to the extended search period, they might gain an advantage by becoming more familiar with a occupational field and thus improve their occupational decision.

The participation in pre-vocational training probably is in the least cases an intentional part of career planning (unlike educational upgrading discussed above). Adolescents participate due to a number of reasons: Too high aspirations, delay in career planning, choice avoidance, being unsuccessful in securing a vocational training position, and possibly too low skill levels. While they gain time and extend their search period as well, the mechanism here is more of cooling-off of high aspirations and making concessions to accept a vocational training position which is available on the local labor market. During the pre-vocational training those individuals probably go through a career planning process, which those who transitioned directly already did during school. If the pre-vocational training includes work experience placements, the individuals can accumulate more knowledge about labor market opportunities, learn about what they like and do not like, and through networking reduce search costs. Hence, they probably end up at similar positions as those transitioning directly after grade 9, but might be less well matched to their original desired occupation and less satisfied because they had to adjusted their expectations.

This framework also fits the impression we get from comparing students' aspirations regarding their transition after grade 9 during school and their realized transition after grade 9, which is shown in Table 5.2. The difference between idealistic and realistic aspirations seems to be the smallest for those students entering directly into vocational training. Already two thirds of them aspired the direct transition. The majority of students continuing schooling (both general and vocational) planned to do so during grade 9, too. There is a larger share (ca. 30 %) who wished to start a vocational training directly after grade 9 (idealistic aspiration). This share is smaller when considering the options realistically, but still 23 % of the students who continue schooling planned to directly enter vocational training. Participants in pre-vocational training experience the largest adjustment of aspirations. Only 4 % expect the participation realistically when surveyed. Still half of the students who ended up in pre-vocational training realistically expected to enter directly into vocational training after school.

The type of transition might also be taken as a signal for trainability and productivity (Spence, 1973). There is the impression that in particular pre-vocational training has a stigma of being a useless waiting loop (Beicht, 2009; Kohlrausch, 2012; Kübler et al., 2019). Students only participate when they did not find a vocational training position, but need to fulfill their compulsory schooling time.[10] This could indicate a negative selection and would lead employers to assess the participation in pre-vocational training as a signal for negative selection with respect to trainability and productivity (Spence, 1973) which makes it more difficult to enter high paying vocational training positions. The continuation of general schooling is likely to be a positive signal as it signals lower cost for schooling. Following this argument also vocational school would be beneficial following the signaling theory. However, the impact might depend on the prestige of vocational schools in the local labor market.

[10]Only the state of Berlin does not have compulsory schooling until the age of 18 (Vossenkuhl, 2010).

Table 5.2: Descriptive Statistics of Aspirations After Grade 9 by Transition Path

	Realized Transition Path			
	Pre-voc. training	Vocational school	General school	Direct transition
Idealistic Aspirations				
Continue general schooling	0.42	0.57^{***}	0.57^{***}	0.23^{***}
Direct transition into voc. training	0.44	0.32^{***}	0.30^{***}	0.66^{***}
Pre-voc. training	0.02^{**}	0.01	0.01	0.01
other	0.11	0.10	0.12^{*}	0.10
Realistic Aspirations				
Continue general schooling	0.36^{***}	0.70^{***}	0.71^{***}	0.22^{***}
Direct transition into voc. training	0.50^{***}	0.23^{***}	0.23^{***}	0.72^{***}
Pre-voc. training	0.04^{***}	0.01	0.01^{**}	0.01
other	0.09^{***}	0.06	0.05	0.05

Notes: Survey questions of wave 2 (summer 2011) on idealistic school aspirations "If it were up to you: What would you prefer to do after 9th grade?" and on realistic aspirations "And when you think realistically: What do you think you will really do after 9th grade? I probably will...". Vocational school was not provided as an option in the survey. Stat. significant difference relative to all three other groups: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Overall, I expect the continuation of general schooling and vocational school to beneficial for the type of vocational training compared to transitioning directly into vocational training. Regarding the match of desired and realized occupation and level of satisfaction I expect no difference or even a negative effect. Expectations for pre-vocational training compared to the direct transition are ambiguous.

5.5 Empirical Approach

Selection into the different transition paths is not random as shown in Section 5.3.2, thus the comparison of the means like in Table 5.1 is probably biased by selection effects. Given the comprehensive data available in the NEPS I use a selection-on-observables approach and estimate the following model to determine the effect of different transition paths after grade 9 compared to the direct transition into vocational training:

$$y_i = \alpha + \boldsymbol{\beta}\, transition_i + \gamma X_i + \delta X_c + \theta X_{sc} + \vartheta X_{lm} + \tau X_{st} + u_i, \tag{5.1}$$

where y_i is one of the outcome variables described in Section 5.3.1, $\boldsymbol{\beta}$ is the vector of coefficients for the type of transition – pre-vocational training, vocational school, and general school –, entering the estimations as factor variable with the base category direct transition. Thus, the effect of transition paths is estimated with respect to a direct transition into vocational training after grade 9. X_i are the individual control variables, X_c control variables on class level, X_{sc} control variables on school level, X_{lm} control variables for local apprenticeship market, and X_{st} control variables on state level as described in Section 5.3.1 and Table 5.A.2 (in Appendix). Controls for imputed variables (see Table 5.A.2) are included in the estimations. Standard errors are clustered on the school level.

For binary outcome variables, I estimate Probit models:

$$P(y_i = 1|X_i, X_c, X_{sc}, X_{lm}, X_{st}) = \Phi(\alpha + \boldsymbol{\beta}\, transition_i + \gamma X_i + \delta X_c + \theta X_{sc} + \vartheta X_{lm} + \tau X_{st}) \quad (5.2)$$

In this selection-on-observables approach the causal effects of the transition paths can only be identified when all variables that influence both the selection into the transition paths and the type of vocational training are included in the model. Hence, I will discuss a number of possible limitations of this approach in the context of this analysis and to what extend they limit the causal interpretation of the results.

The available observable characteristics that might determine selection into the transition type are discussion in Section 5.3. Contrary to many other studies analyzing school-to-work transitions in Germany before, using the NEPS data makes it possible to account for differences in cognitive skills, independently of school grades, many non-cognitive skills, aspirations and motivational aspects (e.g. self-concepts regarding school and application effort) as well as regional labor market effects (Solga, 2015). The analysis on the selection into transition paths in Section 5.3.2, in particular Table 5.A.4, shows that the model can explain a large share of the variation. Unfortunately, the selection into pre-vocational training and vocational school are the least well explained by the observable covariates. But robustness checks in Section 5.6.3 show in stepwise addition of covariates the same tendency as the results of the selection estimations: The covariates seem to account for a negative selection into pre-vocational training and a more positive selection in vocational school (at least with respect to grades and cognitive skills). Given the selection-on-observables approach, I cannot entirely exclude that there are unobservable characteristics that might affect both selection into transition paths and the type of vocational training.

The control variables are collected during grade 9, before the transition path is taken. Only the variable on application effort (number of occupations applied to) is also based on information from later waves because using application effort during grade 9 for those not planning to directly transition into vocational training, anticipation effects would make the variable unreliable. Based on the timing of the survey, it seems plausible to assume that the transition path has no effect on the control variables. But anticipation effects might be relevant with regard to school grades, advancement of career planning, and take-up of career guidance support.
Students anticipating to continue schooling might be less motivated to improve their school grades, be less advanced in their career planning, and take-up less career guidance activities because they believe to still have time to do this during the next school year. Comparing average school grades of those students continuing general schooling by their realistic aspiration "continue schooling" vs. "other transition" (which means "direct transition" in the vast majority of cases, see realistic aspirations in Table 5.2) shows no significant difference (not shown). This applies as well for students attending vocational school. There are small differences in tested skills (those anticipating to continue schooling have significant higher reading competence), which might indicate that anticipating students received grades below their skill level. But as those skill levels are included in the model, the groups are still comparable when conditioning on covariates. There are no indications for reduced career guidance or application activities due to anticipating the continuation of schooling (within the group of those actually continuing general schooling), but those anticipating to continue schooling describe themselves as less advanced in their career planning. As improving career planning is part of the

expected effect of a detour after grade 9 (see Section 5.4), this should not bias the estimated effect.
Anticipation of participation in pre-vocational training is unlikely to affect the control variables as the share of students anticipating pre-vocational training as transition path is very small (see Table 5.2) and thus I do not expect this to be a driver of the results.

As mentioned above in Section 5.3.1 due to the panel structure of the data, panel attrition is not evenly distributed between transition types. Students who continue general school are followed within their school and thus are much more likely to remain in the sample than students leaving general school after grade 9. Those in the sample might be positively selected, this is particularly true for individuals taking the transition path of vocational school or pre-vocational training because the time span until the start of a vocational training is potentially longer. However, the most decisive step "staying in the sample after leaving the sample school" has to be done across all transition types and might be more relevant. Additionally, it is possible to control for background characteristics relevant for panel attrition in the estimations (Steinhauer and Zinn, 2016). Probably the most important selection in the context of school-to-work transition is the selection into vocational training. While I discuss this selection in Section 5.6.3 I need to stress that the scope of this approach only allows interpretations conditional on the transition into vocational training. A more extended discussion of issues of sample selection is presented in Section 5.6.3.

A limitation of this approach is that it is not possible to disentangle the effect of the transition path and a possible age effect. Any of the considered detours delay the start of the vocational training by at least a year, accordingly the individuals mature and might reach other types of vocational training position independently of the transition path they take. If this is the case, the estimated effects would be positively biased. I investigate in Section 5.6.2 how relevant the age effect might be for my analysis, but I am not able to complete rule it out.

5.6 The Effect of Transition Path on the Type of Vocational Training

In this section the overall effects of transition paths are presented first. Additional heterogeneous effects by state type and gender and the analysis of effect mechanisms are shown as well as robustness checks.

In Table 5.3 the effects of different transition paths on the type and quality of vocational training are presented. The direct transition into vocational training serves as reference group for all other transition paths. The results on the different outcomes show an unambiguous picture: The detour with continuing general schooling or going to a vocational school pays off in terms of wages, socioeconomic status, and prestige of the training occupation, but comes at the cost of lower satisfaction with the vocational training and a less likely match of desired and realized training occupation. Compared to the direct transition adolescents transitioning through vocational school into vocational training earn the highest starting wages during the vocational training (positive effect of 81 Euros) and are trained in occupations with the highest average wages (+214 Euros). Thus an increase of about half (starting wage) and a third (average wage) of the respective standard deviation (see Table 5.1). Students continuing general school are closely behind vocational school attendees with regards to wages (+78 Euros and +193

Euros respectively) while they are trained in occupations with the highest prestige (+2.2 points) and socioeconomic status (+4.1 points), both roughly a fourth of the respective standard deviation.

Table 5.3: Effects of Transition Paths on Vocational Training

	Match occup.	Drop-out	Wage	Prestige occup.	SES occup.	Av. wage occup.	Level of satisfact.
Type of transition, reference: Direct transition							
Pre-voc. training	-0.26***	0.02	35.20***	-0.23	0.05	40.44	-0.96***
	(0.04)	(0.03)	(13.45)	(0.57)	(0.69)	(37.53)	(0.14)
Voc. school	-0.25***	0.08**	80.99***	1.85***	3.87***	214.41***	-0.77***
	(0.04)	(0.04)	(13.82)	(0.55)	(0.87)	(44.28)	(0.14)
Gen. school	-0.28***	0.03	78.11***	2.20***	4.10***	192.84***	-0.60***
	(0.03)	(0.03)	(9.57)	(0.44)	(0.55)	(33.84)	(0.09)
Observations	2190	2779	2165	2702	2702	2694	2303
R^2			0.11	0.12	0.23	0.35	0.11

Notes: All controls included, see full models in Table 5.A.5 in Appendix. Average marginal effects of probit estimations for match of occupations and drop-out. Standard errors in parentheses clustered by school, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

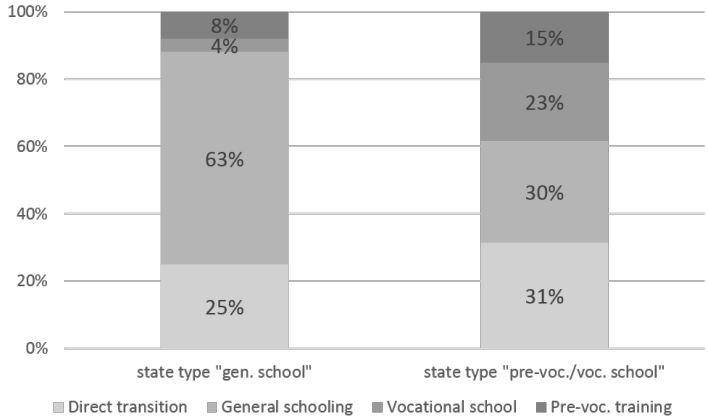
However, regardless of the type of detour, students transitioning directly into a vocational training are more likely to match it with their desired occupation during grade 9 and are more satisfied with the vocational training than students continuing schooling. This is also true compared to participants of pre-vocational training. They are particularly unsatisfied with their vocational training (-0.96 in a 1 to 10 Likert scale with a standard deviation of 1.53). With regard to the type of vocational training there are no significant differences between individuals transitioning directly in vocational training and those participating in pre-vocational training first. The latter only earn slightly more during the vocational training. The probability to drop out of vocational training is significantly higher for those going through vocational school than for those transitioning directly, but it does not differ for other transition paths.

5.6.1 Heterogeneous Effects

The observed overall effects might be driven by particular subgroups in the sample, either specified by personal characteristics or more general categories. I test heterogeneous effects by migratory background, gender, school-based vocational training (vs. apprenticeship with part-time schooling), and type of educational system of the state. There are no relevant heterogeneous effects by migratory background and school-based vocational training (hence not shown), but for two other subgroups.

The transition path chosen by students after grade 9 is correlated with the state's educational system as documented in Table 5.A.3 (in Appendix). When going to school in a state with a high share of students continuing general schooling, students are more likely to do the same. The state's educational system might also affect the way the chosen transition path is perceived when applying for vocational training positions. The educational system sets the norm and shapes the views of employers and schools reviewing applications. Thus, subgroups of state types are formed based on the share of students choosing those two transition paths. The states Baden-Württemberg, Hesse, and Rhineland-Palatinate have the highest shares of students participating in programs

Figure 5.2: Share of Transitions Paths by State Type



Notes: State type "general school" N=1935, State type "pre-vocational training/vocational school" N=844.

of pre-vocational training and vocational schools. Those states aggregated to one subgroup make up 30 % of the sample of individuals starting a vocational training.[11] Figure 5.2 shows the share of transition paths for the two state types "general school" and "pre-vocational training/vocational school". 63 % of the students going to schools in states of type "general school" continue general school while this transition path makes up only 30 % in states of type "pre-voc. training/voc. school". In those states 23 % attend vocational schools and 15 % participate in programs of pre-vocational training, those two transition types together constitute the largest group. The share of students transitioning directly into vocational training is comparable with 25 % and 31 %, respectively.

Based on the following model the heterogeneous effects by state type are estimated:

$$y_i = \alpha + \boldsymbol{\beta}\, transition_i + \eta\, statetype_i + \boldsymbol{\mu}\, transition_i * statetype_i + \gamma X_i + \delta X_c + \theta X_{sc} + \vartheta X_{lm} + \boldsymbol{\tau} D_{st} + u_i, \quad (5.3)$$

where $\boldsymbol{\beta}$ is the vector of the coefficients for the transition type, η the effect of state type "pre-voc. training/voc. school", $\boldsymbol{\mu}$ the vector of the coefficients of the interaction term of transition type and state type. D_{st} are dummy variables for states, to make sure that $statetype_i$ does not only capture a state effect.[12] The estimation results are presented as marginal effects by state type and transition type. All effects are compared to the direct transition in the respective state type.

Table 5.4 shows the marginal effects of the transition path in each of the state types compared to the respective subgroup transitioning directly into vocational training. With regard to wages, both during the vocational training and average wage of the occupation, the effects are more positive for students in states of the type "pre-voc. training/voc. school" over all transition types. However, students of those states also seem to drive the negative effects on match probability of desired and realized training occupation and level of satisfaction.

[11] Those states are slightly oversampled (Students are 6.2 pp more likely to be in the sample.), but this oversampling is not attributed to one of the three states (Results cannot be shown due to data protection rules.).

[12] The respective Probit model for binary outcomes is: $P(y_i = 1|X_i, X_c, X_{sc}, X_{lm}, X_{st}) = \Phi(\alpha + \boldsymbol{\beta}\, transition_i + \eta\, statetype_i + \boldsymbol{\mu}\, transition_i * statetype_i + \gamma X_i + \delta X_c + \theta X_{sc} + \vartheta X_{lm} + \boldsymbol{\tau} D_{st})$.

Table 5.4: Heterogeneous Effects of Transition Paths on Vocational Training – by State Type

Reference: Direct transition	Match occup.	Drop-out	Wage	Prestige occup.	SES occup.	Av. wage occup.	Level of satisfact.
Pre-vocational training							
state type "gen. school"	-0.18***	0.02	17.68	-0.58	-1.07	62.78	-0.87***
	(0.05)	(0.04)	(14.93)	(0.68)	(0.78)	(44.32)	(0.18)
state type "pre-voc./voc. school"	-0.38***	0.03	55.55**	0.10	1.62	15.22	-1.12***
	(0.06)	(0.04)	(22.09)	(0.92)	(1.12)	(58.00)	(0.22)
Vocational school							
state type "gen. school"	-0.15***	0.09	78.64***	2.09**	3.79***	109.71**	-0.86***
	(0.05)	(0.06)	(22.06)	(0.89)	(1.32)	(51.90)	(0.25)
state type "pre-voc./voc. school"	-0.34***	0.08*	84.65***	1.77**	4.40***	269.96***	-0.80***
	(0.05)	(0.04)	(19.67)	(0.72)	(1.15)	(59.38)	(0.17)
General school							
state type "gen. school"	-0.25***	0.03	64.05***	1.60***	3.30***	156.94***	-0.62***
	(0.03)	(0.03)	(9.04)	(0.49)	(0.65)	(35.97)	(0.11)
state type "pre-voc./voc. school"	-0.34***	0.05	85.06***	2.41***	4.16***	216.83***	-0.59***
	(0.05)	(0.04)	(19.19)	(0.65)	(0.86)	(49.79)	(0.14)
Observations	2190	2779	2165	2702	2702	2694	2303

Notes: Marginal effects of transition type compared to respective subgroup with direct transition in vocational training. Additionally to controls equivalent to Table 5.A.5, state dummies are included, standard errors in parentheses clustered by school, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Compared to the direct transition, students participating in pre-vocational training from states, where this path is more common, earn significantly higher wages during vocational training (+55.55 Euros). However, they are also much less satisfied, the effect is close to the standard deviation of 1.53. This might be due to the fact that they are much less often matched with their desired occupation than students transitioning directly in the same state type. They are 38 pp less likely to match the occupations than those transitioning directly, while students in states of type "general school" are only 18 pp less likely to match.
When attending vocational school there are no heterogeneous effects by state type with regards to being satisfied, even though the match quality is differently affected by state type. Again, students from states of type "pre-voc. training/voc. school" are driving the negative effect on match quality. They, however, benefit from higher average wages and also slightly higher starting wages during vocational training. The effect of continuing general school compared to transitioning directly are also heterogeneous by state type, however, with regard to other outcomes. Students in state type "pre-voc. training/voc. school" have a higher starting wage and are trained in occupations with more prestige and socioeconomic status compared to those transitioning directly. The effects on match quality and level of satisfaction are much less heterogeneous by state type.

There is some evidence that the observed overall effects are driven by students from the states where pre-vocational training and vocational schools are more common. With regards to wages, match quality and level of satisfaction this is particularly true for the transition path through pre-vocational training and vocational schools. The positive effects might be explained by pre-vocational training and vocational schools being more common and accepted by employers in those states. The large negative effect of pre-vocational training on the level of satisfaction in those states does not fit to this explanation. However, students from state of type "pre-voc. training/voc. school" participating in pre-vocational training have significantly higher aspirations measured by

the socioeconomic status of their desired occupation than students from other state while there is no difference among those students transitioning directly (not shown).[13] Thus they might be particularly disappointed that their aspirations are not met and thus are unsatisfied.

Transition paths differ by gender: Men are more likely to transition directly into vocational training while women are more likely to go to vocational or general school (see Table 5.A.3 in Appendix). Thus, I check whether there are heterogeneous effects by gender estimated with the following model:

$$y_i = \alpha + \boldsymbol{\beta}\, transition_i + \eta\, male_i + \boldsymbol{\mu}\, transition_i * male_i + \varsigma\, occ_i + \gamma X_i + \delta X_c + \theta X_{sc} + \vartheta X_{lm} + \tau X_{st} + u_i, \quad (5.4)$$

where $\boldsymbol{\beta}$ is the vector of the coefficients for the transition type, η the effect of gender (here: male), $\boldsymbol{\mu}$ the vector of the coefficients of the interaction term of transition type and gender.[14] Additionally to the standard control variables, equivalent to model (5.1), occ_i the occupational sector is added as factor variable, in order to account for occupational segregation by gender. All effects are compared to the direct transition in same gender group.

Table 5.5 shows the marginal effects of the transition paths by gender relative to the direct transition into vocational training. There are no heterogeneous effects by gender among the participants of pre-vocational training. The small positive effect on starting wage during vocational training is significant for men only, but the point estimate for women is very similar in size.
The effects of vocational school are more heterogeneous by gender: The positive effect on the starting wage compared to transitioning directly is considerably larger for women than for men, but men benefit slightly more from vocational school over transitioning directly with respect to average wages in their training occupation. Attending vocational school also leads to a significant and large increase in socioeconomic status of the training occupation, compared to the direct transition into vocational training. Women benefit as well, but with a slightly smaller point estimate. As occupational sectors are included in the model, those differences are unlikely to be attributed to occupational segregation by gender. There is remarkable effect heterogeneity of vocational school by gender on the drop-out probability and on the level of satisfaction with the vocational training. While female attendees of vocational school drive the overall effect on drop-out probability, male attendees drive the negative effect on the level of satisfaction. Female attendees of vocational schools are 14 pp more likely to drop out of vocational training than women who transition directly into vocational training. But men who attend vocational school are much less satisfied with their vocational training than their male counterparts after a direct transition.
The effects of general school as transition path are less heterogeneous by gender. The proportion of the heterogeneous effects regarding starting wage and average wage are similar to the effects of vocational school, but the differences are smaller. The negative effects of general school on the probability to match desired and realized occupation and on the level of satisfaction are smaller for women than for men.

[13] There is no difference in the level of life satisfaction in grade 9 by state type among participants in pre-vocational training. There is also no remarkable difference in selection into pre-vocational training based on observables.

[14] The respective Probit model for binary outcomes is: $P(y_i = 1|X_i, X_c, X_{sc}, X_{lm}, X_{st}) = \Phi(\alpha + \boldsymbol{\beta}\, transition_i + \eta\, male_i + \boldsymbol{\mu}\, transition_i * male_i + \varsigma\, occ_i + \gamma X_i + \delta X_c + \theta X_{sc} + \vartheta X_{lm} + \tau X_{st})$.

Table 5.5: Heterogeneous Effects of Transition Paths on Vocational Training – by Gender

Reference: Direct transition	Match of occup.	Drop-out	Wage	Prestige occup.	SES occup.	Av. wage occup.	Level of satisfact.
Pre-voc. training							
Female	-0.26***	0.04	36.80	0.09	0.67	56.32	-0.99***
	(0.06)	(0.04)	(23.17)	(0.96)	(1.28)	(46.09)	(0.21)
Male	-0.25***	0.01	35.52**	-0.41	-0.28	29.69	-0.94***
	(0.05)	(0.04)	(14.72)	(0.63)	(0.73)	(53.04)	(0.19)
Vocational school							
Female	-0.21***	0.14***	102.48***	2.01**	3.27**	192.04***	-0.47***
	(0.05)	(0.05)	(19.83)	(0.84)	(1.48)	(50.48)	(0.17)
Male	-0.27***	0.01	65.26***	1.80**	4.80***	235.17***	-1.07***
	(0.05)	(0.05)	(19.51)	(0.76)	(1.22)	(68.09)	(0.21)
General school							
Female	-0.21***	0.04	88.07***	2.45***	4.66***	181.58***	-0.54***
	(0.04)	(0.04)	(13.42)	(0.67)	(0.93)	(41.01)	(0.12)
Male	-0.33***	0.03	73.51***	2.03***	3.72***	200.39***	-0.64***
	(0.03)	(0.03)	(11.02)	(0.50)	(0.59)	(40.62)	(0.10)
Observations	2190	2779	2165	2702	2702	2694	2303

Notes: Marginal effects of transition type compared to respective subgroup with direct transition in vocational training. Additionally to controls equivalent to Table 5.A.5, occupational sectors are included, standard errors in parentheses clustered by school, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Overall, with regards to wages, transitioning through vocational school is the most beneficial for women, they also have the highest level of satisfaction among the detour transition paths. Prestige and socioeconomic status of the training occupation are higher for women after general school compared to transitioning directly. However, they also drop out more often and are the driver of the overall effect on drop-out probability. The heterogeneous effects for men are more ambiguous: While average wages and socioeconomic status are higher after vocational school, starting wage and prestige are slightly higher after general school. Vocational training also considerably increases the dissatisfaction. It seems that women and men who attend vocational school react differently to dissatisfaction: Women drop out of vocational training while men remain in vocational training, but are less satisfied. As female students have higher aspirations regarding the socioeconomic status of their desired occupation than men, they might drop out in order to follow those aspirations.

5.6.2 Effect Mechanisms

When interpreting the results, possible mechanisms behind the effects of the different transition paths need to be considered. For instance, intermediate outcomes of the transition path, like upgrading of secondary school qualification, could drive the observed results.

The first intermediate outcome considered is whether the individuals upgrade his/her secondary school qualification (see Section 5.2). Even though it might be the original goal, not all students continuing schooling are able to upgrade their school qualification. 82 % of the transition path "general school", 67 % of the path "vocational school", 46 %

of the path "direct transition", and 26 % of the participants in pre-vocational training have reached a qualifying lower secondary school qualification or higher at the beginning of vocational training. Hence, I will check whether the upgrading of school qualification is the driving force behind the observed effects.

Considering that upgrading is the foremost goal and obvious benefit of delaying the begin of vocational training, at least for a transition through general and vocational school, we would expect that the positive effects of the delayed transition is mostly driven by those individuals upgrading their school qualification. However, it is also possible that the schooling itself, without credentials, increases productivity and represents a positive signal to the employer. The effects of transition paths by level of secondary school qualification at the start of the vocational training are estimated in the following model:

$$y_i = \alpha + \boldsymbol{\beta}\, transition_i + \eta\, upgrade_i + \boldsymbol{\mu}\, transition_i * upgrade_i + \gamma X_i + \delta X_c + \theta X_{sc} + \vartheta X_{lm} + \tau X_{st} + u_i, \quad (5.5)$$

where $\boldsymbol{\beta}$ is the vector of the coefficients for the transition type, η the effect of upgrading the secondary school qualification, $\boldsymbol{\mu}$ the vector of the coefficients of the interaction term of transition type and upgrading. The dummy variable $upgrade_i$ is one when the individual has reached a qualifying lower secondary school or middle track secondary school qualification until the start of the vocational training.[15] Interpretation of this model is problematic because upgrading could be a "bad control" (Angrist and Pischke, 2009, pp. 64–68) as it is an intermediate outcome. Thus, this analysis only serves for better understanding possible mechanisms.

Table 5.6 shows the effects of the transition paths with and without upgrading of the school qualification compared to the respective subgroup transitioning directly into vocational training. The results show that the effects of delayed transition paths are not completely driven by upgrading, but it does play an important role, at least for some pathways. When participants of pre-vocational training upgrade their school qualification, they earn higher wages than individuals with the same level of school qualification starting the vocational training directly. The advantage of pre-vocational training without upgrading is much smaller and weakly significant. Participation in pre-vocational training without upgrading makes individuals much less satisfied with their vocational training than individuals without upgrading starting vocational training directly. I find a similar effect for continuing general schooling. Here, the low level of satisfaction seems to be driven by those not upgrading their school qualification, too. The positive effect of continuation of general school on prestige, socioeconomic status, and average wage of the training occupation seems to be mostly driven by upgrading, while the effect on wage during vocational training hardly differs by upgrading. The advantage of vocational schooling over the direct transition into vocational training is not driven by a upgraded school qualification: The effect heterogeneity is very small. However, overall individuals, who upgraded their school qualification, are more likely to drop out of vocational training than those transitioning directly. This result is particularly strong after vocational school. The higher drop-out rate combined with less dissatisfaction might point to higher educational aspirations of those who upgraded. They do not seem to drop out because they are unsatisfied with their vocational training (at least not compared to those who did not upgrade), but probably want to pursue higher education.

I additionally check whether the overall effect is driven by those who reach a middle track

[15] The respective Probit model for binary outcomes is: $P(y_i = 1|X_i, X_c, X_{sc}, X_{lm}, X_{st}) = \Phi(\alpha + \boldsymbol{\beta}\, transition_i + \eta\, upgrade_i + \boldsymbol{\mu}\, transition_i * upgrade_i + \gamma X_i + \delta X_c + \theta X_{sc} + \vartheta X_{lm} + \tau X_{st})$.

Table 5.6: Effects of Transition Paths and Intermediate Outcomes on Vocational Training – Upgrading of Secondary School Qualification

Reference: direct transition	Match of occup.	Drop-out	Wage	Prestige occup.	SES occup.	Av. wage occup.	Level of satisfact.
Pre-vocational training							
no upgrading	-0.27***	-0.01	29.62*	0.24	0.51	62.29	-1.11***
of qualification	(0.04)	(0.04)	(15.11)	(0.67)	(0.67)	(45.24)	(0.19)
upgrading of	-0.24***	0.06	69.78***	-0.77	-0.31	-4.35	-0.71***
qualification	(0.06)	(0.05)	(24.29)	(0.97)	(1.29)	(51.83)	(0.19)
Vocational school							
no upgrading	-0.30***	0.04	81.83***	1.78**	3.17**	211.64***	-0.78***
of qualification	(0.06)	(0.05)	(22.39)	(0.79)	(1.23)	(69.69)	(0.20)
upgrading of	-0.21***	0.12***	73.28***	1.41*	3.58***	200.93***	-0.70***
qualification	(0.05)	(0.04)	(16.54)	(0.82)	(1.13)	(56.36)	(0.16)
General school							
no upgrading	-0.34***	0.03	68.79***	0.96	1.78*	78.39	-0.90***
of qualification	(0.05)	(0.04)	(13.20)	(0.71)	(0.93)	(48.51)	(0.14)
upgrading of	-0.26***	0.07***	65.90***	1.58***	3.38***	185.55***	-0.44***
qualification	(0.04)	(0.03)	(10.56)	(0.54)	(0.70)	(43.15)	(0.11)
Observations	2190	2779	2165	2702	2702	2694	2303

Notes: Marginal effects of transition type compared to respective subgroup with direct transition in vocational training. All controls equivalent to Table 5.A.5 included, standard errors in parentheses clustered by school, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

secondary school qualification until the beginning of the vocational training, which is the goal of most who continue general school or attend to vocational school. I exclude those with a middle track secondary school qualification from the estimation sample, which leaves us with roughly 60 % of the sample, and repeat the estimations of Table 5.3. The effect sizes decrease slightly, more strongly for general schooling, but the overall direction, significance, and ranking of transition paths remain the same (not shown). While I cannot exclude that part of the observed effect of the different transition paths are due to the upgrading, it does not seem plausible that this is the sole driver of the effect. This is particularly true for the effect of vocational school.

Of those adolescents starting vocational training, about 70 % of adolescents transition directly after finishing general, vocational school, or the pre-vocational training program. Another 16-19 % needs another year until starting vocational training, the rest takes two or more years. This transition period could be an intermediate outcome of the transition path chosen after school and also influence the outcome in vocational training. Excluding stepwise those individuals of the estimation sample, who took one year or two years and more until starting vocational training, slightly changes the size of the effects, but neither ranking, significance, or direction of the effect (see Table 5.7 for the probability to match desired occupation with realized training occupation). Thus, it seems plausible that the observed effects are not driven by additional activities after the transition path of interest here.

The latter analysis gives some indication that the negative effect of the delayed transition into vocational training on the probability to match training occupation with the reported desired occupation might not driven by the time lag between reporting the desired occupation and entering vocational training. If career planning would is volatile and adolescents change their desired occupation within a couple of years, the observed

Table 5.7: Effects of Transition Paths on Match of Desired Occupation and Training Occupation and Time Lag of Vocational Training Start

	baseline sample	Start voc. train. within 1 year	Start voc. train. within 2 years
Type of transition, reference: Direct transition			
Pre-vocational training	-0.255***	-0.187***	-0.234***
	(0.037)	(0.040)	(0.038)
Vocational school	-0.251***	-0.205***	-0.249***
	(0.037)	(0.041)	(0.039)
General school	-0.282***	-0.253***	-0.283***
	(0.028)	(0.029)	(0.029)
Observations	2190	1727	2004

Notes: Average marginal effects of Probit estimations. All controls equivalent to Table 5.A.5 included. Standard errors in parentheses clustered by school, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

negative effect of the delayed transition on the probability to match occupations would strongly decrease here. I observe that reducing the sample to those entering vocational training within one year after school/pre-voc. training leads to smaller negative effects of delayed transition, but the effects are still strong.

Closely related to the analysis above is the question whether the effects of detours are driven by an age effect as discussed in Section 5.5. By construction, students transitioning not directly into vocational training are older than the comparison group when they enter vocational training. There are also differences between the type of transition path: Students continuing general schooling are with on average 17.2 years the youngest at start of the vocational training, participants of pre-vocational training are 17.4, and those attending vocational school are on average 17.7 years old. Those age differences derive either from differences in the length of the program (programs at vocational schools usually last two years, while the continuation of general schooling should last one year.) or from a time lag after the observed transition type, for instance due to additional participation in pre-vocational training programs. The age at the end of grade 9 is included as control variable, thus delayed school enrollment or grade repetition should not be relevant. As the age effect cannot be disentangled in comparison with the direct transition, those observations are excluded from the sample to estimate a model interacting the type of transition with the age category (categories: 16 and younger, 17, 18 years and older):

$$y_i = \alpha + \boldsymbol{\beta}\, transition_i + \boldsymbol{\eta}\, age_i + \boldsymbol{\mu}\, transition_i * age_i + \gamma X_i + \delta X_c + \theta X_{sc} + \vartheta X_{lm} + \tau X_{st} + u_i, \quad (5.6)$$

where $\boldsymbol{\beta}$ is the vector of the coefficients for the transition type (base category: general schooling), $\boldsymbol{\eta}$ the vector of the coefficients for the age category at the start of the vocational training (base category: 17 years), $\boldsymbol{\mu}$ the vector of the coefficients of the interaction term of transition type and age.[16] The aim of this analysis is to show whether there is effect heterogeneity by age within the type of transition. If an age effect is driving the results, the effects should be larger for individuals who are older at the start of the vocational training (smaller for those who are younger).

[16]The respective Probit model for binary outcomes is: $P(y_i = 1|X_i, X_c, X_{sc}, X_{lm}, X_{st}) = \Phi(\alpha +$

Table 5.8: Effects of Transition Paths and Age Effect

Reference: 17 years	Match of occup.	Drop-out	Wage	Prestige occup.	SES occup.	Av. wage occup.	Level of satisfact.
16 years and younger							
Pre-vocational training	0.07	0.14**	-19.35	-0.83	-0.26	-185.57**	0.19
	(0.08)	(0.07)	(27.88)	(1.22)	(1.45)	(86.08)	(0.38)
Vocational school	*-0.19**	*0.05*	*10.41*	*-0.23*	*-0.41*	*78.34*	*0.03*
	(0.10)	*(0.11)*	*(46.32)*	*(1.86)*	*(3.56)*	*(139.65)*	*(0.68)*
General school	0.06*	-0.02	-1.33	0.79	-0.62	28.69	0.22**
	(0.03)	(0.03)	(10.66)	(0.50)	(0.66)	(31.29)	(0.11)
18 years and older							
Pre-vocational training	-0.15**	0.12**	22.87	-1.34	1.04	23.78	0.09
	(0.07)	(0.05)	(22.49)	(0.89)	(1.32)	(70.06)	(0.35)
Vocational school	-0.06	0.07	24.33	-0.24	1.25	-11.19	-0.23
	(0.06)	(0.06)	(23.94)	(0.91)	(1.50)	(78.83)	(0.23)
General school	-0.07**	0.11***	36.53***	0.08	0.89	112.11***	-0.37***
	(0.03)	(0.03)	(12.19)	(0.49)	(0.80)	(32.13)	(0.12)
Observations	1578	2029	1580	1985	1985	1979	1616

Notes: Observations after direct transition are excluded. Marginal effects of transition type in the respective age category compared to 17 years. Effects of vocational school in age category "16 years and younger" should not be interpreted due to small sample size. All controls equivalent to Table 5.A.5 included, standard errors in parentheses clustered by school, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5.8 shows the marginal effects of the age at start of vocational training by transition type compared to the average age of 17 years, estimated with the reduced sample (excluding direct transitions). As consistent with an age effect older apprentices who participated in pre-vocational training are less likely to match desired and realized training occupation, but there are no other significant marginal effects compared to younger participants of pre-vocational training. The marginal effects of older students attending vocational school compared to average aged students are not significant and small in size. The subgroup of students attending vocational school and being 16 years and younger is very small hence the results should not be be interpreted. Hence, there is no indication that the overall effects of vocational school are driven by an age effect. However, effects of the continuation of general schooling are mostly significant for older individuals and also of considerable size. As consistent with an age effect they are less likely to match desired and realized occupation and younger students. They are also less satisfied than younger apprentices and earn higher wages. There are no differences with regard to prestige and socioeconomic status of the training occupation by age.

There is some indication for an age effect for those who continued general school at least with respect to most of the outcome variables. The effect of continued general schooling on prestige and socioeconomic status does not seem to be driven by the age at start of the vocational training. There is no indication for an age effect for pre-vocational training and vocational school. Only the effect on match quality seems to be driven by age of participants of pre-vocational training.

$\boldsymbol{\beta}\, transition_i + \boldsymbol{\eta}\, age_i + \boldsymbol{\mu}\, transition_i * age_i + \gamma X_i + \delta X_c + \theta X_{sc} + \vartheta X_{lm} + \tau X_{st})$.

5.6.3 Robustness Checks

In this section we test for a number of possible threats to the identification of the effect of the transition paths on the type of vocational training.

To evaluate the model specification and learn how the control variables affect the estimated effects of the transition paths, I add covariates stepwise as shown in Tables 5.A.6-5.A.12 (in Appendix). Overall the estimated effects of transition paths remain quite stable over the stepwise addition of covariates. It is, however, noticeable that adding control variables changes the estimated effects of pre-vocational training (for match of occupations, drop-out, and wage) and vocational school (prestige and SES of occupation) the most. The estimated effects of pre-vocational training change the most when personal and family characteristics or career planning variables are added (see, for example, for the drop-out probability, Table 5.A.7). For the adjustment of the estimated effects of vocational and general schooling are non-cognitive skills and local labor markets additionally relevant (see, for example, for average wage of vocational training occupation, Table 5.A.11). Apparently, the control variables correct for negative selection into pre-vocational training as the effect becomes larger, significant, or positive/less negative. The opposite is observed for the effect of vocational schools. Including control variables show to be relevant to correct for selection in transition paths and behave in an expected manner.

There are a number of steps in this analysis where sample selection might affect the results. I test whether the selection into the sample, into vocational training, or missing outcome variables drive the results.

The research question requires panel data information and thus panel attrition might been an issue. Individuals continuing general schooling are more likely to remain in the panel because the survey is conducted on class level as long as possible. I estimate the propensity score to remain in the panel based on the 5,030 lower track secondary school students, which are observed in 9^{th} grade, using the control variables of the main analysis (not including the variables on application behavior). The main analysis (see Table 5.3) is repeated with observations weighted by their probability to remain in the sample (inverse probability weighting). The results are shown in the first panel of Table 5.9. The results hardly change after weighting. The point estimates for wage during vocational training and average wage in training occupation slightly change, but significance, direction, and ranking of the effects remain the same.

The next level of potential selection is the selection into vocational training. The effects of transition paths on the type and quality of vocational training identified above only apply for those individuals who start a vocational training at some point in the observed time span. However, we know that only 68 % of those adolescents, who do not transition directly in a vocational training, actually end up in a vocational training. While it is beyond the scope of this paper to fully account for this selection, I want to make this selection transparent and test whether the control variables used in the main estimations can also explain the selection in vocational training. Table 5.A.13 in Appendix shows the results of three Probit estimations on the probability to start a vocational training. The first column includes the full sample, the second column the reduced sample of those, who do not transition directly in vocational training, and the third column including the type of transition path in the model. I find that the significant explanatory variables of the selection in vocational training do not change by sample. Migratory background, socioeconomic status of mother's occupation, and low household income decreases the probability to start a vocational training. School grades and cognitive skills are not or

Table 5.9: Effects of Transition Paths on Vocational Training – Weighted for Sample Selection

	Match occup.	Drop-out	Wage	Prestige occup.	SES occup.	Av. wage occup.	Level of satisfact.
Weighted by inverse probability to remain in panel							
Type of transition, reference: Direct transition							
Pre-voc. training	-0.24***	0.03	31.27**	-0.12	0.06	44.53	-0.90***
	(0.04)	(0.03)	(14.29)	(0.56)	(0.69)	(39.21)	(0.14)
Voc. school	-0.25***	0.08**	81.71***	1.89***	3.89***	221.28***	-0.76***
	(0.04)	(0.04)	(14.19)	(0.58)	(0.89)	(46.56)	(0.14)
General school	-0.27***	0.03	81.86***	2.25***	4.21***	188.58***	-0.59***
	(0.03)	(0.03)	(9.86)	(0.46)	(0.57)	(34.97)	(0.09)
Observations	2190	2779	2165	2702	2702	2694	2303
Weighted by inverse probability to start vocational training							
Type of transition, reference: Direct transition							
Pre-voc. training	-0.25***	0.03	38.40***	-0.20	0.13	52.41	-0.94***
	(0.04)	(0.03)	(13.85)	(0.59)	(0.74)	(39.63)	(0.14)
Voc. school	-0.25***	0.08**	82.62***	1.79***	3.94***	228.46***	-0.74***
	(0.04)	(0.04)	(14.37)	(0.57)	(0.89)	(45.13)	(0.14)
General school	-0.28***	0.03	78.58***	2.10***	3.99***	194.32***	-0.58***
	(0.03)	(0.03)	(9.76)	(0.46)	(0.59)	(33.87)	(0.09)
Observations	2190	2779	2165	2702	2702	2694	2303

Notes: All controls included, see full models in Table 5.A.5 in Appendix. Average marginal effects of Probit estimations for match of occupations and drop-out. Model for propensity score estimation for sample selection (first panel) includes control variables of main analysis without variables on application behavior. Model for propensity score estimation for selection in voc. training (second panel) is equivalent to model of the first column in Table 5.A.13. Standard errors in parentheses clustered by school, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

very weakly significant with small effects. Good work experience placements, student job, and many applications also make it more likely to enter vocational training and are, besides local labor market characteristics, the most relevant driver of selection into vocational training. Accordingly, those variables are also included in the estimation model above.

I additionally test whether weighting by the probability to enter into vocational training changes the results (second panel in Table 5.9). The propensity score is estimated using the model of the first column in Table 5.A.13. The results hardly change by inverse probability weighting. The effects of pre-vocational training and vocational school on wage during vocational training and average wages slightly increase.

Table 5.10: Effects of Transition Paths on Vocational Training – Reduced Sample

	Match occup.	Drop-out	Wage	Prestige occup.	SES occup.	Av. wage occup.	Level of satisfact.
Type of transition, reference: Direct transition							
Pre-voc. training	-0.30***	0.04	67.04***	-0.00	1.20	92.89*	-0.95***
	(0.06)	(0.05)	(18.60)	(0.78)	(0.94)	(55.40)	(0.15)
Voc. school	-0.24***	0.06	69.91***	1.51*	3.41***	239.98***	-0.91***
	(0.05)	(0.04)	(17.45)	(0.80)	(1.03)	(59.05)	(0.19)
Gen. school	-0.29***	0.00	87.31***	1.54**	3.43***	207.64***	-0.64***
	(0.03)	(0.03)	(11.51)	(0.61)	(0.73)	(44.16)	(0.12)
Observations	1453	1453	1453	1453	1453	1453	1453

Notes: All controls equivalent to Table 5.A.5 included. Average marginal effects of Probit estimations for match of occupations and drop-out. Standard errors in parentheses clustered by school, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Even if individuals stay sufficiently long in the panel and enter a vocational training, we do not necessarily observe all outcomes variables for them. Thus, I reduce the sample for all estimations to those observations for whom we observe all outcome variables. The estimation results of this sample of 1,435 individuals are presented in Table 5.10. This reduced sample seems to be a more positive selection compared to those transitioning directly into vocational training. The effects mostly increase, particularly with respect to wages for those participating in pre-vocational training. The higher drop-out probability of former students of vocational schools decreases and is not significant anymore, however, this subgroup in the reduced sample is also less satisfied with vocational training than in the estimation sample.

Table 5.11: Descriptive Statistics of Imputed Outcome Variables by Transition Type – Full Sample

	Pre-voc. training	Voc. school	Gen. school	Direct transition	Obs.
Match desired/ training occupation	0.21***	0.24*	0.21***	0.47***	2779
High wage in voc. training	0.30	0.40***	0.36***	0.26***	2779
High SES of voc. training occupation	0.17***	0.41***	0.36***	0.16***	2779
High prestige of voc. training occupation	0.29***	0.44*	0.43***	0.31***	2779
High av. wage of voc. training occupation	0.29***	0.48***	0.41***	0.30***	2779
High level of satisfaction with voc. training	0.16***	0.23***	0.32***	0.52***	2779

Notes: Stat. significant difference relative to all three other groups: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

As an alternative check of the relevance of the estimation sample I construct dummy

variables indicating a high level of each of the continuous outcome variables and impute missing variable with zero.[17] The descriptive means by transition paths are shown in Table 5.11. Table 5.12 shows the average marginal effects of the respective Probit estimations on the full sample of individuals who started a vocational training. The overall effects do not change: Continuing schooling (both general and vocational) is superior in terms of economic outcomes to starting a vocational training right after school, but comes at the cost of lower satisfaction and match quality of the occupation. The full sample results show also the same effects of pre-vocational training which does not give an advantage over the direct transition, only with respect to the wage during vocational training which is slightly higher compared to the direct transition into vocational training. The ranking between the delayed transition paths mostly stays the same, only for the match of desired and realized training occupation pre-vocational training and vocational school switch ranks. The effects are very close together in the reduced sample (-0.26 and -0.25, see Table 5.3), and are now with the full sample -0.20 and -0.18.

Table 5.12: Effects of Transition Paths on Vocational Training – Full Sample

	Drop-out	Match of occup.	High Wage	H. Prestige of occup.	H. SES of occup.	H. Av. wage of occup.	H. Level of satisfaction
Type of transition, reference: Direct transition							
Pre-voc. training	0.021	-0.196***	0.084**	0.019	-0.018	0.023	-0.337***
	(0.029)	(0.029)	(0.035)	(0.026)	(0.031)	(0.030)	(0.030)
Voc. school	0.075**	-0.178***	0.157***	0.164***	0.070**	0.186***	-0.264***
	(0.035)	(0.031)	(0.031)	(0.030)	(0.035)	(0.035)	(0.033)
Gen. school	0.032	-0.222***	0.182***	0.171***	0.095***	0.170***	-0.197***
	(0.026)	(0.023)	(0.024)	(0.021)	(0.028)	(0.026)	(0.027)
Observations	2779	2779	2779	2779	2779	2779	2779

Notes: Average marginal effects of Probit estimations. All controls equivalent to Table 5.A.5 included. Standard errors in parentheses clustered by school, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

This representation of the effects also allows an easier interpretation of some of the results. We learn, for instance, that the continuation of general school or the vocational school increase the probability for a high wage at the beginning of the vocational training, high prestige and high average wage of the training occupation by 15.7 to 18.6 pp compared to the direct transition. The probability of a high socioeconomic status of the training occupation is only increased by 7 to 9.5 pp. The probability to be very satisfied with the vocational training is 33.7 pp lower after participating in pre-vocational training, 26.4 pp lower after going to vocational school, and 19.7 pp lower when continuing general school compared to transition directly in vocational training.

Overall, it seems that the results are robust to sample changes. Weighting for probability to remain in the sample or to enter an vocational training does not change the results. Reducing the sample to those for whom all outcome variables are observed leads to the largest changes, but the general tendency of the results remains the same.

5.7 Conclusions

I find that a delayed transition into vocational training after lower track secondary school is not a disadvantage conditional on a successful transition in vocational training. Students benefit from continuing general schooling or attending vocational school compared

[17] The definition of the variables are described in Table 5.A.2 in Appendix.

to transitioning directly with regard to wages paid during vocational training as well as average wages, prestige, and socioeconomic status of the training occupation. This comes at the cost of a lower probability to match the training occupation with the reported desired occupation and being less satisfied with the vocational training. Attending vocational school before the vocational training makes dropping out of vocational training more likely. Participation in pre-vocational training does not lead to a different type of vocational training position than after a direct transition. However, those participants are less satisfied with their vocational training.

These results on economic outcomes are in accordance with the theoretical considerations expecting positive effects of continued schooling (both general and vocational). They show as well that participants of pre-vocational training probably face some stigma as they do not benefit from the delay compared to the direct transition despite potential increase in human capital. The heterogeneous effects by state type support this argument as the effect of pre-vocational training and vocational school is more positive in states where this transition path is more common. Hence, participants in this case might face less stigma. The results confirm as well the expectation that they are negatively selected and need time to compensate lower skills and delayed career planning.

Overall, benefits of vocational school seem to be slightly higher compared to general school, particularly with regard to wages, with level of satisfaction and match quality being similar. Vocational school seem to offer advantages beyond the upgrading of school qualification. Comparison among the detour transition path show that those results are not driven by age. However, those programs are not equally available across states and some evidence suggests that the programs' benefits are driven by states where they are relatively common. Women benefit less from a delayed transition with regard to average wages and drop-out probability, but more with regard to starting wage during the vocational training and prestige of their training occupation. The analyses on effect mechanisms show that upgrading of secondary school qualification plays an important role for the positive effects of a delayed transition, but it does not explain the entire effect of general and vocational school. Particularly, attending vocational school seems to be beneficial independent of upgrading the secondary school qualification as the effects differ only little.

Robustness checks show that the results are robust to several selection issues. They show as well that control variables are important to account for selection into transition paths. We have to keep in mind that these results do not allow an overall evaluation of pre-vocational training, vocational, and general schools, but condition on the successful transition into vocational training after the detour. It is beyond the scope of this paper to assess whether possible negative labor market outcomes for those not entering vocational training after pre-vocational training or the continuation of schooling would offset the observed positive effects. There is also more research necessary to study the long term labor market effects of the different transition types, for example, when IAB employment biographies are linked with NEPS survey data. This paper cannot assess whether individuals, who transition directly into vocational training, benefit in the long run from the earlier start of accumulating firm- and occupation-specific human capital. When returns to firm-specific human capital are high in their occupations the lower wage and prestige levels might be (partly) offset later.

The downside of the positive economic effects is that the detour seems to have a negative effect on the match quality and level of satisfaction with the vocational training. The particularly low levels of satisfaction of former participants of pre-vocational training seem to be driven by those from states where pre-vocational training is a relatively

common transition path and those not upgrading their secondary school qualification. Equivalently, after continuing general school without a higher secondary school qualification adolescents are less satisfied with the vocational training. Disappointment of not being able to improve their labor market opportunities and reach the desired occupation might be an explanation for the observed effect. But this explanation does not hold for those attending vocational or general school with higher secondary school qualification because they were able to enter more prestigious and better paying occupations than those transitioning directly. As drop-out probability is also positively correlated with upgrading and continued schooling, maybe high educational aspirations might explain the dissatisfaction as those apprentices decide to pursue a higher education entrance qualification and tertiary education instead of vocational training.
Further analyses on effect mechanisms show that a time lag after pre-vocational training or school does not drive the effects and, at least for pre-vocational training and vocational school age at start of the vocational training is not the driver of differences between the detour transition path. Hence, it seems unlikely that age is the driving force behind these effect, but the effect of age cannot be ruled out completely. Preferences with regard to the desired occupation as well as the expectations regarding a vocational training could change over time and thus with age. A delayed start of vocational training automatically leads to a higher age and thus we cannot disentangle the effect of delayed transition and age when comparing it to the direct transition.

Given that individual preferences determine the relative utility of economic outcomes and satisfaction, it remains an open question which transition path is overall the most beneficial. But we can establish that a delayed transition, even through pre-vocational training, is not per se a waste of time and a stigma on the labor market. The determination of the individual preferable transition path seems to require timely, personal career guidance counseling.

5.A Appendix

Table 5.A.1: Observed Programs of Pre-vocational Training

Program and description	Share
"Berufsvorbereitungsjahr (BVJ)": 1-year school-based program providing both general and vocational curriculum, including career guidance, and the possibility to gain the lower track secondary school qualification (if it was not reached after grade 9)	0.28
"Berufseinstiegsjahr (BEJ)": 1-year program, mostly school-based, but includes a work experience placement and requires a lower track secondary school qualification. Only offered in the state of Baden-Württemberg.	0.23
1-year "Berufsfachschule": school-based 1-year "Berufsfachschule" requires a lower track secondary school qualification and offers both general and vocational curriculum	0.17
"Berufsgrundbildungsjahr (BGJ)": requires a lower track secondary school qualification and is often credited as first year of vocational training	0.13
Other program offered by the employment agency	0.09
"Einstiegsqualifizierung (EQ)": 6 to 12 months work experience placement with part-time vocational school	0.03
other program	0.06
Observations	440

Table 5.A.2: Description of Variables

Variable	Description
Outcome variables measured in waves 3 to 9	
Match of desired occupation and occupation of vocational training	Binary variable, set to 1 when occupations match on the 3-digit-level of the KldB2010. Desired occupation is the reported realistic occupation aspiration in grade 9 (wave 2, summer 2011). Variable is missing when either desired occupation or occupation of vocational training is missing.
Drop-out of vocational training within first year	Binary variable, set to 1 when duration of vocational training is less than 12 months and no vocational qualification is reported.
Level of satisfaction with vocational training	Categorical variable measuring the level of satisfaction using a Likert scale ranging from 1 (entirely dissatisfied) to 10 (entirely satisfied). The individuals are asked separately about their satisfaction with the school-based and firm-based part of their vocational training. Thus for apprenticeships we calculate the average of the two values, for school-based vocational training we only take the school-based value.
Starting wage in vocational training	The wage is reported as monthly wage after tax, and is set to zero when school-based vocational training without pay.
Socioeconomic status (SES) of occupation of vocational training	The ISEI-08 score developed by Ganzeboom (2010) and Ganzeboom, Graaf, et al. (1992) maps occupations in a range of 11.56 to 88.96 in a combination of level of education and income.
Prestige of occupation of vocational training	The SIOPS-08 score developed by Ganzeboom and Treiman (2003) and Treiman (1977) ranges from 0 to 100 and is a prestige ranking based on surveys from 55 countries.
Average wage of occupation of vocational training	Average monthly wage before tax in 2010, matched on the occupation of vocational training in East/West-gender-occupation-cells using the occupation classification KldB2010. Data source of wages: Federal Statistical Office (Statistisches Bundesamt), Verdienststrukturerhebung 2014.

continued on next page

Continuation of Table 5.A.2

Variable	Description
High level of satisfaction with vocational training	Binary variable, set to 1 if level of satisfaction is 8.5 or better, set to 0 otherwise (including missings).
High starting wage in vocational training	Binary variable, set to 1 if starting wage in vocational training is 500 Euros or more, set to 0 otherwise (including missings).
High SES of occupation of vocational training	Binary variable, set to 1 if the ISEI-08 score of the occupation of the vocational training is 37 or higher, set to 0 otherwise (including missings). The score of 37 has been determined to represent occupations that are mostly occupied by individuals having reached at least a middle track secondary school qualification (Schuchart, 2011).
High prestige of occupation of vocational training	Binary variable, set to 1 if the SIOPS-08 score of the occupation of the vocational training is 43 or higher, which is equivalent to above the median. Set to 0 otherwise (including missings).
High average wage of occupation of vocational training	Binary variable, set to 1 if average wage is 2837 Euros or above, set to 0 otherwise (including missings).
Control Variables measured in wave 1 and 2	
Personal characteristics and family background	
Age in 2011	Age in years at in July 2011 (end of grade 9).
Gender: male	Binary variable, set to 1 if male.
Migratory background	Binary variable, set to 1 if at least one parent is born outside of Germany. Reported by students, added by parent. Missings imputed with 0.
Mediocre/Bad health	Binary variable, set to 1 if self-reported health status is mediocre or worse. Missings imputed with mean of original categorical variable.
SES of father's occupation	Standardized socioeconomic status (ISEI-08 score) of father's occupation. Reported by parents, added by student. Missings imputed with mean.
SES of mother's occupation	Standardized socioeconomic status (ISEI-08 score) of mother's occupation. Reported by parents, added by student. Missings imputed with mean.
HH income $<$ 2500 Euro	Binary variable, set to 1 if household income is below 2500 Euros. Reported by parent. Missings imputed with 0.
Own room at home	Binary variable, set to 1 if students has own room available at home. Missing imputed with 0.
School grades	
German grade 2011	Categorical variable ranging from 1 (very good) to 6 (deficient), the average of 4 (sufficient) is necessary to pass a class and grade. Final grade in German of grade 9. Missings imputed with mean.
Math grade 2011	Categorical variable ranging from 1 (very good) to 6 (deficient), the average of 4 (sufficient) is necessary to pass a class and grade. Final grade in Math of grade 9. Missings imputed with mean.
Cognitive skills	
Reading competence	Weighted maximum likelihood estimate of reading competence, with 0 as mean. Missing imputed with mean.
Reading speed	Standardized reading speed for full sample of starting cohort 4. Missing imputed with mean.
Vocabulary	Standardized vocabulary competence for full sample of starting cohort 4. Missing imputed with mean.
Math competence	Weighted maximum likelihood estimate of math competence, with 0 as mean. Missing imputed with mean.
Reasoning	Standardized reasoning competence for full sample of starting cohort 4. Missing imputed with mean.
Perceptual speed	Standardized perceptual speed for full sample of starting cohort 4. Missing imputed with mean.
Non-Cognitive skills, personality traits	

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Continuation of Table 5.A.2

Variable	Description
Personality traits 'Big Five': openness, neuroticism, conscientiousness, agreeableness, extraversion	Five variables describing the Big Five personality traits. Ranging from 1 to 5 (variables are averages of two survey items). Missings imputed with mean.
Self concepts: German, Math, school	Self concept of abilities in school (overall), Math, and German specifically. Score 1 to 4, variables are average of three survey items. Missing imputed with mean.
SDQ prosocial behavior	Binary variable, set to 1 for noticeable prosocial behavior defined by the SDQ score (Strengths and Difficulties Questionnaire) (see Lohbeck et al., 2015). Missings of original variable imputed with mean.
SDQ problematic behavior	Binary variable, set to 1 for noticeable problematic behavior defined by the SDQ score (Strengths and Difficulties Questionnaire) (see Lohbeck et al., 2015). Missings of original variable imputed with mean.
level of life satisfaction	Categorical variable measuring the level of satisfaction with life using a Likert scale ranging from 1 (entirely dissatisfied) to 10 (entirely satisfied). Missings imputed with mean. Only included in model on level of satisfaction with vocational training.
Career guidance activities, career planning, application behavior	
Career planning: advanced	Binary variable, set to 1 if self-reported career planning is advanced. Missings imputed with 0.
SES of desired occupation	Socioeconomic status (ISEI-08 score) of reported desired occupation in grade 9 (wave 2, summer 2011). Missing imputed with mean.
Duration of work experience placements	Factor variables with categories: one week or less, two weeks, and three or more weeks (reference group). Missing imputed with mean.
Work experience placement helpful	Binary variable, set to 1 if work experience placement described as helpful for career planning. Missings imputed with 0.
JIC visit	Binary variable, set to 1 if job information center (JIC) of the employment agency was independently visited. Missings imputed with 0.
Counseling by employment agency	Binary variable, set to 1 if students took up at least once a counseling meeting with the employment agency. Missings imputed with 0.
Student job	Binary variable, set to 1 if student has a student job during grade 9. Missings imputed with 0.
Applied to 3 or more voc. training occupations	Binary variable, set to 1 if student sent out applications for 3 or more different vocational training occupations, including applications until apprenticeship start). Missing imputed with 0.
Characteristics of State, local labor market, school, and class	
Intensity of career guidance activities at school	Factor variable with categories: little, average (reference group), and a lot. Variable summarizes the offered career guidance activities reported by the school's principal and aggregate over average number of activities. Missings imputed with mean.
School: Grade 10 available	Binary variable, set to 1 if school offers grade 10. Missings imputed with 0.
Class: High share migratory background	Binary variable, set to 1 if share of students with migratory background in class is reported to be 50 % or more (reported by students, if missing teacher's information). Missing of original categorical variable imputed with mean.
Class: High share low social class	Binary variable, set to 1 if share of students of low social class in class is reported to be 50 % or more (reported by head teacher). Missing of original categorical variable imputed with mean.

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Continuation of Table 5.A.2

Variable	Description
State: high share general schooling	Binary variable, set to 1 if 67 % of the students in the state or more continue general schooling. The share of students transition through a particular type of transition is highly correlated with the state as the state's education policy determines for example the availability of programs at vocational schools or grade 10 at lower track secondary schools.
Regional vocational training market type	Factor variable with 12 categories for different apprenticeship market types described by Kleinert and Kruppe (2012).
Additional variables for robustness checks and effect mechanisms	
Occupational sector of desired occupation	Categorical variable based on the KldB2010, dividing occupations in 5 occupational sectors: Occupations in production of goods (base category), in personal services, in business administration and other business related services, service occupations in the IT-sector and the natural sciences, and other occupations in commercial services. Missings imputed separately by gender with subgroup mean.
Upgrading of secondary school qualification	Binary variable, set to 1 if the individual's secondary school qualification at start of the vocational training is higher than a lower secondary school qualification, i.e. a qualifying lower secondary school qualification ("qualifiziernder Hauptschulabschluss") or middle track secondary school qualification ("Mittlere Reife"). Missings of secondary school qualification imputed with mean by transition path.
Age at start of vocational training	categorical variable with categories "16 years and younger", "17 years", and "18 years and older".

Table 5.A.3: Selection into Transition Path

Reference: direct transition	Pre-voc. training	Voc. school	General school
age in 2011	0.029***	-0.009	-0.031***
	(0.006)	(0.007)	(0.006)
Gender: male	0.009	-0.047***	-0.027***
	(0.011)	(0.012)	(0.011)
migratory background	0.024**	0.005	0.013
	(0.011)	(0.012)	(0.011)
Mediocre/Bad Health	0.013	0.007	-0.014
	(0.012)	(0.013)	(0.011)
SES of father's occupation	-0.008	-0.006	0.008
	(0.006)	(0.005)	(0.005)
SES of mother's occupation	0.004	0.001	0.005
	(0.005)	(0.005)	(0.005)
HH income < 2500 Euro	0.025*	0.010	-0.018
	(0.014)	(0.015)	(0.014)
own room at home	0.021	-0.038**	-0.003
	(0.016)	(0.016)	(0.014)
German grade 2011	0.048***	-0.016*	-0.003
	(0.008)	(0.008)	(0.007)
Math grade 2011	0.020***	-0.035***	0.005
	(0.006)	(0.007)	(0.006)
Comp: reading competence	-0.010	0.011*	0.013**
	(0.006)	(0.006)	(0.005)
Comp: reasoning	0.010*	-0.000	0.004
	(0.005)	(0.006)	(0.005)
Comp: perceptual speed	0.000	0.001	0.000
	(0.005)	(0.005)	(0.004)
Comp: reading speed	-0.003	-0.002	0.005

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Continuation of Table 5.A.3

Reference: direct transition	Pre-voc. training	Voc. school	General school
	(0.006)	(0.006)	(0.005)
Comp: math	-0.021***	-0.020***	0.024***
	(0.007)	(0.008)	(0.007)
Comp: vocabulary	0.006	-0.001	0.004
	(0.007)	(0.007)	(0.006)
B5: openness	0.005	0.005	0.001
	(0.006)	(0.006)	(0.005)
B5: neuroticism	-0.005	-0.002	-0.001
	(0.006)	(0.006)	(0.006)
B5: conscientiousness	-0.006	-0.009	-0.007
	(0.006)	(0.006)	(0.006)
B5: agreeableness	0.003	-0.013	0.008
	(0.007)	(0.008)	(0.007)
B5: extraversion	-0.002	-0.005	-0.010*
	(0.006)	(0.006)	(0.005)
self concept: German	0.006	0.018*	0.007
	(0.009)	(0.010)	(0.009)
self concept: math	-0.003	-0.005	0.012**
	(0.007)	(0.007)	(0.006)
self concept: school	-0.037***	0.003	0.029***
	(0.010)	(0.011)	(0.010)
SDQ prosocial behavior,	-0.028	0.015	-0.037**
noticeable	(0.018)	(0.019)	(0.019)
SDQ problematic behavior,	0.021	-0.020	-0.007
noticeable	(0.014)	(0.016)	(0.015)
Career planning: advanced	-0.012	-0.042***	-0.004
	(0.011)	(0.013)	(0.011)
Work exp. duration, Reference: three or more weeks			
One week or less	-0.006	-0.029*	-0.005
	(0.015)	(0.015)	(0.015)
Two weeks	0.006	0.009	0.002
	(0.014)	(0.015)	(0.013)
Work Exp. helpful	-0.011	-0.012	-0.038***
	(0.012)	(0.013)	(0.011)
JIC visit	-0.002	0.010	-0.013
	(0.013)	(0.016)	(0.014)
Counseling Employ. Agency	0.022	0.012	-0.053***
	(0.014)	(0.016)	(0.013)
Student job	-0.021**	-0.001	-0.004
	(0.011)	(0.011)	(0.010)
School: Career guidance intensity, Reference: average			
Little	-0.001	-0.006	0.026**
	(0.013)	(0.014)	(0.013)
A lot	0.030**	-0.007	0.015
	(0.014)	(0.014)	(0.012)
School: Grade 10 avail.	-0.018	-0.017	0.060***
	(0.013)	(0.013)	(0.014)
Class: High share	0.008	0.006	-0.010
migratory background	(0.012)	(0.013)	(0.011)
Class: High share	0.009	-0.031**	0.001
low social class	(0.012)	(0.012)	(0.011)
State: high share general schooling	-0.019	-0.018	0.130***
	(0.014)	(0.016)	(0.012)
Regional vocational training market type			
Reference: Western G., rural, large secondary sector, high competition			
Eastern G: few stud., high unemploy.,	0.016	-0.049*	-0.144***
rural, large secondary sector	(0.043)	(0.026)	(0.044)
Eastern G: few students, high unemploy.,	0.167***	-0.095***	0.121*
rural, av. market	(0.063)	(0.011)	(0.063)
Eastern G: few students, high unemploy.,	0.001	-0.075***	-0.046
fav. market	(0.047)	(0.023)	(0.030)
Dynamic large cities, fav. market,	-0.037*	-0.015	-0.009
low competition	(0.021)	(0.019)	(0.018)
Dynamic large cities, urban,	-0.082***	0.051**	0.012
strong large companies	(0.018)	(0.021)	(0.019)

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Continuation of Table 5.A.3

Reference: direct transition	Pre-voc. training	Voc. school	General school
Western G, large companies,	-0.028	0.060***	-0.001
urban, av. market	(0.021)	(0.021)	(0.017)
Western G, large companies, urban,	-0.040**	0.036**	-0.001
low unemploy., high competition	(0.017)	(0.016)	(0.016)
Western G, large companies,	-0.060	0.189**	-0.025
urban, high unemploy.	(0.053)	(0.082)	(0.043)
Western G, low unemploy.,	-0.023	0.054***	0.003
good market, av. competition	(0.017)	(0.016)	(0.014)
Western G, rural, no large companies,	-0.060**	0.060**	-0.089***
low unemploy., high competition	(0.024)	(0.028)	(0.026)
Observations	3730	3730	3730

Notes: Average marginal effects of multinomial logit estimation, controls for imputed variables included. Standard errors clustered by school in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5.A.4: Selection into Transition Path (OLS)

	Pre-voc. training	Voc. school	General school	Direct transition
Age in 2011	0.046***	-0.002	-0.063***	0.019**
	(0.008)	(0.009)	(0.010)	(0.009)
Gender: male	0.017	-0.039***	-0.049***	0.071***
	(0.014)	(0.013)	(0.015)	(0.016)
Migratory background	0.023*	0.003	0.021	-0.046***
	(0.012)	(0.012)	(0.016)	(0.014)
Mediocre/Bad Health	0.012	0.017	-0.029*	-0.001
	(0.013)	(0.017)	(0.017)	(0.016)
SES of father's occupation	-0.007	-0.007	0.010	0.004
	(0.005)	(0.005)	(0.007)	(0.006)
SES of mother's occupation	0.005	0.000	0.004	-0.009
	(0.005)	(0.005)	(0.007)	(0.006)
HH income <2500 Euro	0.040**	0.014	-0.040*	-0.014
	(0.017)	(0.015)	(0.021)	(0.017)
Own room at home	0.027*	-0.036**	-0.019	0.028
	(0.015)	(0.018)	(0.025)	(0.019)
German grade 2011	0.055***	-0.016*	-0.016	-0.023**
	(0.009)	(0.009)	(0.012)	(0.009)
Math grade 2011	0.025***	-0.030***	-0.004	0.010
	(0.007)	(0.007)	(0.009)	(0.007)
Comp: reading competence	-0.008	0.006	0.023***	-0.021***
	(0.006)	(0.007)	(0.009)	(0.008)
Comp: reasoning	0.008	-0.002	0.017**	-0.022***
	(0.006)	(0.007)	(0.007)	(0.007)
Comp: perceptual speed	0.001	0.001	-0.002	-0.000
	(0.005)	(0.006)	(0.007)	(0.006)
Comp: reading speed	-0.007	-0.011	0.029***	-0.012
	(0.007)	(0.008)	(0.009)	(0.008)
Comp: math	-0.029***	-0.040***	0.075***	-0.006
	(0.007)	(0.009)	(0.011)	(0.009)
Comp: vocabulary	0.008	0.001	-0.006	-0.002
	(0.007)	(0.008)	(0.009)	(0.008)
B5: openness	0.002	0.004	0.008	-0.014**
	(0.006)	(0.006)	(0.007)	(0.007)
B5: neuroticism	-0.002	-0.003	-0.005	0.010
	(0.005)	(0.007)	(0.009)	(0.007)
B5: conscientiousness	-0.011*	-0.011	0.000	0.021***
	(0.006)	(0.006)	(0.008)	(0.008)
B5: agreeableness	0.002	-0.013	0.013	-0.002
	(0.008)	(0.009)	(0.010)	(0.009)
B5: extraversion	-0.000	-0.008	-0.008	0.016**
	(0.007)	(0.007)	(0.008)	(0.007)
Self concept: German	0.010	0.018	0.010	-0.038***

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Continuation of Table 5.A.4

	Pre-voc. training	Voc. school	General school	Direct transition
	(0.010)	(0.012)	(0.013)	(0.012)
Self concept: math	0.005	-0.003	-0.001	-0.000
	(0.008)	(0.007)	(0.010)	(0.007)
Self concept: school	-0.040***	-0.004	0.043***	0.001
	(0.011)	(0.014)	(0.014)	(0.013)
SDQ prosocial behavior, noticeable	-0.029	0.019	-0.069***	0.079***
	(0.022)	(0.022)	(0.025)	(0.028)
SDQ problematic behavior, noticeable	0.032*	-0.022	-0.022	0.011
	(0.020)	(0.016)	(0.021)	(0.021)
Career planning: advanced	-0.008	-0.036***	-0.048***	0.091***
	(0.013)	(0.013)	(0.016)	(0.017)
Work exp. duration, Reference: three or more weeks				
One week or less	-0.001	-0.047*	0.000	0.048**
	(0.022)	(0.024)	(0.027)	(0.023)
Two weeks	0.014	0.012	0.010	-0.036*
	(0.016)	(0.021)	(0.026)	(0.019)
Work Exp. helpful	-0.000	0.000	-0.073***	0.073***
	(0.012)	(0.012)	(0.016)	(0.014)
JIC visit	0.002	0.004	0.001	-0.007
	(0.016)	(0.017)	(0.018)	(0.017)
Counseling Employ. Agency	0.053***	0.026*	-0.120***	0.041**
	(0.017)	(0.015)	(0.023)	(0.017)
Student job	-0.030***	0.000	-0.004	0.033**
	(0.011)	(0.013)	(0.013)	(0.014)
School: Career guidance intensity, Reference: average				
Little	-0.011	-0.015	0.045	-0.019
	(0.018)	(0.031)	(0.032)	(0.025)
A lot	0.022	-0.008	0.024	-0.038*
	(0.019)	(0.024)	(0.033)	(0.021)
School: Grade 10 avail.	-0.045**	-0.097***	0.300***	-0.159***
	(0.023)	(0.035)	(0.036)	(0.029)
Class: High share migratory background	-0.001	0.012	-0.010	0.000
	(0.014)	(0.016)	(0.021)	(0.015)
Class: High share low social class	0.018	-0.024	-0.033	0.039**
	(0.015)	(0.022)	(0.027)	(0.018)
State: high share general schooling	-0.105***	-0.120***	0.437***	-0.211***
	(0.016)	(0.025)	(0.031)	(0.021)
Regional vocational training market type				
Reference: Western G., rural, large secondary sector, high competition				
Eastern G: few stud., high unemploy.,	0.083	-0.019	-0.326***	0.263***
rural, large secondary sector	(0.051)	(0.057)	(0.061)	(0.051)
Eastern G: few students, high unemploy.,	-0.031	-0.013	0.061	-0.016
rural, av. market	(0.036)	(0.024)	(0.037)	(0.033)
Eastern G: few students, high unemploy.,	-0.024	-0.030	0.003	0.051
fav. market	(0.049)	(0.026)	(0.061)	(0.049)
Dynamic large cities, fav. market,	-0.007	-0.016	-0.024	0.047
low competition	(0.036)	(0.023)	(0.058)	(0.038)
Dynamic large cities, urban,	-0.054**	0.069*	-0.058	0.043
strong large companies	(0.022)	(0.038)	(0.044)	(0.036)
Western G, large companies, urban,	-0.007	0.055	-0.034	-0.013
av. market	(0.019)	(0.035)	(0.041)	(0.018)
Western G, large companies, urban,	0.004	0.063*	-0.112***	0.045
low unemploy., high competition	(0.025)	(0.036)	(0.036)	(0.032)
Western G, large companies, urban,	-0.054	0.067*	0.035	-0.048
high unemploy.	(0.037)	(0.039)	(0.079)	(0.030)
Western G, low unemploy., good market,	-0.007	0.045*	0.008	-0.047*
av. competition	(0.020)	(0.027)	(0.034)	(0.024)
Western G, rural, no large companies,	-0.007	0.089*	-0.215***	0.134***
low unemploy., high competition	(0.027)	(0.051)	(0.053)	(0.042)
Constant	-0.762***	0.495***	1.343***	-0.076
	(0.136)	(0.166)	(0.188)	(0.153)
Observations	3730	3730	3730	3730
R^2	0.13	0.10	0.41	0.24

Notes: OLS estimations, controls for imputed variables included. Standard errors clustered by school in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5.A.5: Effect of Transition Path on Type of Vocational Training – Full Model

	Match occup.	Drop-out	Wage	Prestige occup.	SES occup.	Av. wage occup.	Level of satisfact.
Type of transition, reference: Direct transition							
Pre-vocational training	-0.26***	0.02	35.20***	-0.23	0.05	40.44	-0.96***
	(0.04)	(0.03)	(13.45)	(0.57)	(0.69)	(37.53)	(0.14)
Vocational school	-0.25***	0.08**	80.99***	1.85***	3.87***	214.41***	-0.77***
	(0.04)	(0.04)	(13.82)	(0.55)	(0.87)	(44.28)	(0.14)
General school	-0.28***	0.03	78.11***	2.20***	4.10***	192.84***	-0.60***
	(0.03)	(0.03)	(9.57)	(0.44)	(0.55)	(33.84)	(0.09)
Age in 2011	-0.04**	0.03***	-5.35	-0.44**	-0.03	-14.04	-0.07
	(0.01)	(0.01)	(4.30)	(0.20)	(0.29)	(14.78)	(0.05)
Gender: male	-0.02	0.00	26.12***	-2.04***	-5.23***	635.77***	-0.09
	(0.02)	(0.02)	(8.50)	(0.38)	(0.56)	(25.99)	(0.08)
Migratory background	-0.04*	0.05**	-9.83	0.38	0.64	57.83**	0.04
	(0.02)	(0.02)	(7.15)	(0.33)	(0.46)	(24.56)	(0.08)
Mediocre/Bad Health	-0.01	0.03	-0.46	-0.40	-0.33	9.83	-0.05
	(0.02)	(0.02)	(8.34)	(0.38)	(0.60)	(26.53)	(0.09)
SES of father's occupation	-0.01	-0.00	-6.53*	0.22	0.59**	10.82	-0.06**
	(0.01)	(0.01)	(3.61)	(0.15)	(0.25)	(11.51)	(0.03)
SES of mother's occupation	0.02*	-0.01	5.32	-0.12	0.35	14.86	0.01
	(0.01)	(0.01)	(3.54)	(0.16)	(0.22)	(10.67)	(0.03)
Household income <2500 Euro	-0.02	0.04*	4.42	0.11	-0.44	7.75	0.01
	(0.03)	(0.02)	(8.68)	(0.42)	(0.61)	(27.70)	(0.10)
Own room at home	0.02	0.00	3.38	0.74*	1.35**	49.49	0.08
	(0.03)	(0.03)	(10.11)	(0.44)	(0.64)	(36.99)	(0.12)
German grade 2011	0.00	-0.00	-8.92*	-0.10	-0.49	-12.15	0.13**
	(0.01)	(0.01)	(5.16)	(0.23)	(0.36)	(16.56)	(0.05)
Math grade 2011	-0.01	0.02**	-5.02	-0.60***	-0.46*	-32.83***	-0.07*
	(0.01)	(0.01)	(4.00)	(0.18)	(0.25)	(12.06)	(0.04)
Comp: reading competence	0.02**	0.02	3.13	0.17	0.42	5.47	-0.04
	(0.01)	(0.01)	(3.99)	(0.17)	(0.25)	(11.66)	(0.04)
Comp: reasoning	-0.01	-0.00	-3.11	-0.11	0.18	11.04	-0.02
	(0.01)	(0.01)	(3.80)	(0.16)	(0.21)	(10.70)	(0.04)
Comp: perceptual speed	-0.01	0.01	-2.59	0.15	0.02	2.49	0.02
	(0.01)	(0.01)	(3.36)	(0.15)	(0.21)	(9.51)	(0.04)
Comp: reading speed	0.00	0.02**	-3.80	-0.22	0.37	15.43	0.01
	(0.01)	(0.01)	(3.61)	(0.18)	(0.24)	(12.05)	(0.04)
Comp: math	0.02	-0.02	2.42	0.39*	0.16	27.69*	-0.05
	(0.01)	(0.01)	(4.83)	(0.22)	(0.32)	(14.71)	(0.05)
Comp: vocabulary	0.00	-0.02	-0.12	-0.22	-0.11	-21.23	0.07*
	(0.01)	(0.01)	(4.62)	(0.20)	(0.28)	(13.26)	(0.04)
B5: openness	0.00	0.01	-6.08*	0.02	0.18	1.47	-0.05
	(0.01)	(0.01)	(3.62)	(0.17)	(0.24)	(10.41)	(0.04)
B5: neuroticism	0.03**	-0.01	-4.67	-0.08	0.29	-7.58	-0.01
	(0.01)	(0.01)	(4.04)	(0.18)	(0.27)	(11.85)	(0.04)
B5: conscientiousness	0.02*	-0.03***	3.30	0.22	-0.05	6.45	0.11**
	(0.01)	(0.01)	(3.85)	(0.20)	(0.26)	(12.06)	(0.04)
B5: agreeableness	0.02	0.01	4.14	-0.15	0.32	-1.54	0.18***
	(0.01)	(0.02)	(5.43)	(0.21)	(0.30)	(15.98)	(0.06)
B5: extraversion	-0.01	0.00	-2.03	0.02	-0.11	7.88	-0.03
	(0.01)	(0.01)	(3.82)	(0.20)	(0.28)	(12.07)	(0.04)
Self concept: German	0.00	0.03**	1.97	0.54*	0.95***	58.07***	0.10*
	(0.02)	(0.02)	(5.89)	(0.30)	(0.36)	(17.51)	(0.05)
Self concept: math	-0.00	0.00	7.36*	0.06	0.33	-6.11	0.02
	(0.01)	(0.01)	(4.39)	(0.23)	(0.32)	(15.33)	(0.04)
Self concept: school	0.01	0.00	4.36	-0.13	-0.03	4.54	0.12
	(0.02)	(0.02)	(7.42)	(0.31)	(0.46)	(20.81)	(0.07)
SDQ prosocial behavior, noticeable	-0.09**	0.04	14.72	0.10	-0.30	-52.62	-0.00
	(0.04)	(0.03)	(12.91)	(0.61)	(0.74)	(39.86)	(0.14)
SDQ problematic behavior, noticeable	0.02	0.06**	-17.62*	-0.73	-0.78	0.44	0.15
	(0.03)	(0.03)	(10.40)	(0.46)	(0.64)	(30.83)	(0.10)
Life satisfaction							0.08***
							(0.02)
Career planning: advanced	0.05**	-0.00	-1.32	0.04	0.58	-19.88	0.06

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Continuation of Table 5.A.5

	Match occup.	Drop-out	Wage	Prestige occup.	SES occup.	Av. wage occup.	Level of satisfact.
	(0.02)	(0.02)	(7.98)	(0.37)	(0.50)	(23.60)	(0.08)
SES desired occupation	-0.01***	0.00	0.48**	0.05***	0.17***	5.59***	-0.00*
	(0.00)	(0.00)	(0.23)	(0.01)	(0.02)	(0.84)	(0.00)
Work experience placements total duration, Reference: three or more weeks							
One week or less	0.06*	-0.04	13.42	0.68	0.69	10.32	0.18
	(0.03)	(0.03)	(11.05)	(0.47)	(0.63)	(29.58)	(0.11)
Two weeks	0.01	-0.03	12.39	-0.30	-0.05	10.53	0.15
	(0.03)	(0.02)	(10.37)	(0.43)	(0.57)	(27.11)	(0.10)
Work experience pl. helpful	0.06***	-0.00	10.93	0.07	0.99*	-10.87	0.04
	(0.02)	(0.02)	(8.56)	(0.38)	(0.51)	(24.73)	(0.09)
JIC visit	-0.02	0.01	-13.29	-0.90**	-0.96	-86.91***	0.02
	(0.03)	(0.03)	(9.95)	(0.44)	(0.62)	(32.34)	(0.09)
Counseling Employment Agency	-0.03	0.00	-3.32	-0.24	-0.22	19.04	-0.11
	(0.03)	(0.03)	(8.99)	(0.41)	(0.62)	(27.55)	(0.10)
Student job	-0.01	0.01	-9.88	-0.63*	-0.99**	-61.04***	-0.01
	(0.02)	(0.02)	(6.47)	(0.32)	(0.45)	(19.90)	(0.07)
Applied to 3 or more occupations	-0.10***	0.09***	16.09*	1.17***	1.40**	67.17**	-0.09
	(0.03)	(0.02)	(9.68)	(0.42)	(0.69)	(28.74)	(0.10)
School: Career guidance intensity, Reference: average							
Little	0.00	0.00	34.26***	0.41	0.85	84.24***	0.05
	(0.02)	(0.02)	(10.07)	(0.37)	(0.51)	(27.42)	(0.09)
A lot	-0.03	-0.01	7.40	0.09	0.52	18.97	0.08
	(0.02)	(0.02)	(8.78)	(0.38)	(0.55)	(23.66)	(0.10)
School: Grade 10 available	0.06**	0.02	-14.94	0.05	0.79	-18.31	0.09
	(0.03)	(0.03)	(11.49)	(0.41)	(0.53)	(28.43)	(0.10)
Class: High share	-0.00	0.02	22.11***	0.73**	0.71	27.17	-0.06
migratory background	(0.02)	(0.02)	(7.83)	(0.34)	(0.53)	(24.23)	(0.08)
Class: High share	-0.01	0.03	-9.14	-1.00***	-1.13**	-22.21	-0.04
low social class	(0.02)	(0.02)	(8.05)	(0.32)	(0.48)	(23.17)	(0.08)
State: high share	0.01	0.01	-20.54**	-1.07**	-1.30**	-48.09*	0.11
general schooling	(0.03)	(0.02)	(10.06)	(0.44)	(0.64)	(28.15)	(0.10)
Regional vocational training market type, Reference: Western G, rural, large secondary sector, high competition							
Eastern G: few stud., high unemploy.,	-0.13**	-0.02	-48.79	-2.92***	-3.05**	-586.16***	-0.31
rural, large secondary sector	(0.05)	(0.05)	(35.10)	(1.11)	(1.43)	(59.70)	(0.24)
Eastern G: few students,	-0.05	0.08	-11.71	0.55	1.21	-597.11***	-0.04
high unemploy., rural, av. market	(0.03)	(0.06)	(18.78)	(1.22)	(1.84)	(47.18)	(0.30)
Eastern G: few students,	-0.16***	-0.05	-66.81***	-1.60	-0.43	-556.04***	-0.70**
high unemploy., fav. market	(0.05)	(0.04)	(21.82)	(1.23)	(1.72)	(88.60)	(0.34)
Dynamic large cities, fav. market,	-0.06	0.07**	-2.18	-0.37	0.37	16.01	-0.17
low competition	(0.04)	(0.03)	(12.94)	(0.81)	(1.04)	(43.19)	(0.12)
Dynamic large cities,	-0.05	0.08**	9.11	0.80	-0.02	87.78*	-0.34**
urban, strong large companies	(0.04)	(0.04)	(12.79)	(0.63)	(0.82)	(47.94)	(0.13)
Western G, large companies,	-0.04	0.03	-6.33	0.05	0.04	-20.55	-0.16
urban, av. market	(0.03)	(0.03)	(12.69)	(0.44)	(0.68)	(33.66)	(0.12)
Western G, large companies, urban,	0.02	-0.01	7.38	0.16	0.46	46.44	-0.17
low unemploy., high competition	(0.03)	(0.03)	(12.84)	(0.40)	(0.67)	(32.38)	(0.12)
Western G, large companies,	-0.07	0.11*	21.03	-0.14	2.22	-64.87	-0.38*
urban, high unemploy.	(0.11)	(0.07)	(18.21)	(1.27)	(1.39)	(57.31)	(0.23)
Western G, low unemploy.,	0.01	0.02	-5.99	0.12	-0.03	1.68	-0.04
good market, av. competition	(0.03)	(0.03)	(11.10)	(0.44)	(0.67)	(31.93)	(0.09)
Western G, rural, no large companies,	-0.03	0.00	-7.47	1.01	1.28	76.92*	-0.07
low unemploy., high competition	(0.04)	(0.04)	(14.55)	(0.62)	(0.82)	(41.13)	(0.19)
Constant			481.22***	45.52***	24.47***	2212.75***	7.66***
			(75.50)	(3.58)	(5.22)	(273.12)	(0.93)
Observations	2190	2779	2165	2702	2702	2694	2303

Notes: Controls for imputed variables included. Average marginal effects of probit estimations for match of occupations and drop-out. Standard errors in parentheses clustered by school, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5.A.6: Match Desired/Training Occupation – Stepwise Addition of Covariates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Type of transition, reference: Direct transition							
Pre-voc. training	-0.344***	-0.309***	-0.303***	-0.292***	-0.251***	-0.250***	-0.255***
	(0.038)	(0.040)	(0.042)	(0.037)	(0.038)	(0.038)	(0.037)
Voc. school	-0.321***	-0.317***	-0.320***	-0.268***	-0.242***	-0.242***	-0.251***
	(0.039)	(0.038)	(0.038)	(0.038)	(0.037)	(0.038)	(0.037)
Gen. school	-0.346***	-0.348***	-0.351***	-0.302***	-0.272***	-0.284***	-0.282***
	(0.025)	(0.024)	(0.024)	(0.024)	(0.026)	(0.026)	(0.028)
Personal and family characteristics	no	yes	yes	yes	yes	yes	yes
grades and cognitive skills	no	no	yes	yes	yes	yes	yes
non-cognitive skills	no	no	no	yes	yes	yes	yes
career planning	no	no	no	no	yes	yes	yes
school and class characteristics	no	no	no	no	no	yes	yes
local labor market	no	no	no	no	no	no	yes
Observations	2190	2190	2190	2190	2190	2190	2190

Notes: Average marginal effects of Probit estimations. See models in Table 5.A.5 for complete list of control variables. Standard errors in parentheses clustered by school, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5.A.13: Selection into Vocational Training

	Full sample	Red. sample	Transition incl.
Type of transition, reference: General school			
Pre-voc. training			-0.100***
			(0.032)
Voc. school			-0.170***
			(0.032)
Age in 2011	-0.001	-0.007	0.000
	(0.011)	(0.013)	(0.013)
Gender: male	0.015	0.001	0.002
	(0.018)	(0.022)	(0.022)
Migratory background	-0.053***	-0.055***	-0.057***
	(0.016)	(0.020)	(0.020)
Mediocre/Bad Health	0.006	0.009	0.011
	(0.018)	(0.021)	(0.020)
SES father's occupation	-0.003	-0.006	-0.008
	(0.007)	(0.009)	(0.009)
SES mother's occupation	-0.021***	-0.024***	-0.024***
	(0.007)	(0.008)	(0.008)
HH income <2500 Euro	-0.058***	-0.063**	-0.056**
	(0.022)	(0.027)	(0.026)
Own room at home	0.022	0.015	0.015
	(0.021)	(0.026)	(0.026)
German grade 2011	-0.012	-0.006	-0.005
	(0.011)	(0.013)	(0.013)
Math grade 2011	-0.002	-0.004	-0.006
	(0.008)	(0.010)	(0.010)
Comp: reading competence	-0.016*	-0.014	-0.015
	(0.009)	(0.010)	(0.010)
Comp: reasoning	0.008	0.015*	0.014
	(0.007)	(0.009)	(0.009)
Comp: perceptual speed	-0.007	-0.011	-0.010
	(0.007)	(0.008)	(0.008)
Comp: reading speed	-0.006	-0.004	-0.007

Continued on next page

Continuation of Table 5.A.13

	Full sample	Red. sample	Transition incl.
	(0.009)	(0.011)	(0.011)
Comp: math	0.018	0.019	0.008
	(0.011)	(0.014)	(0.014)
Comp: vocabulary	0.015	0.019*	0.019*
	(0.010)	(0.012)	(0.012)
B5: openness	-0.018**	-0.022**	-0.021**
	(0.008)	(0.010)	(0.009)
B5: neuroticism	0.011	0.010	0.010
	(0.009)	(0.011)	(0.011)
B5: conscientiousness	0.034***	0.037***	0.036***
	(0.009)	(0.012)	(0.011)
B5: agreeableness	-0.009	-0.011	-0.014
	(0.011)	(0.013)	(0.013)
B5: extraversion	0.008	0.004	0.004
	(0.008)	(0.010)	(0.010)
Self concept: German	-0.028**	-0.023	-0.022
	(0.013)	(0.016)	(0.016)
Self concept: math	-0.012	-0.012	-0.013
	(0.009)	(0.011)	(0.011)
Self concept: school	0.017	0.019	0.013
	(0.014)	(0.018)	(0.018)
SDQ prosocial behavior, noticeable	-0.005	-0.041	-0.031
	(0.029)	(0.037)	(0.036)
SDQ problematic behavior, noticeable	-0.036*	-0.047*	-0.047*
	(0.021)	(0.027)	(0.027)
Career planning: advanced	0.033*	0.014	0.015
	(0.018)	(0.022)	(0.022)
Work exp. duration, Reference: three or more weeks			
One week or less	0.102***	0.127***	0.118***
	(0.021)	(0.026)	(0.026)
Two weeks	-0.011	0.002	0.001
	(0.020)	(0.023)	(0.023)
Work Exp. helpful	0.074***	0.074***	0.079***
	(0.016)	(0.018)	(0.018)
JIC visit	0.031	0.044*	0.044*
	(0.022)	(0.026)	(0.025)
Counseling Employ. Agency	0.001	0.001	0.013
	(0.022)	(0.027)	(0.027)
Student job	0.043***	0.042**	0.041**
	(0.015)	(0.018)	(0.018)
No. voc. training applications, Reference: no application			
1-3 applications	0.130***	0.052*	0.060**
	(0.022)	(0.030)	(0.029)
4-10 applications	0.124***	0.068**	0.075***
	(0.022)	(0.030)	(0.028)
11 or more applications	0.161***	0.107***	0.113***
	(0.019)	(0.026)	(0.026)
School: Career guidance intensity, Reference: average			
Little	0.034	0.050*	0.047*
	(0.022)	(0.026)	(0.025)
A lot	-0.011	-0.005	-0.005
	(0.021)	(0.023)	(0.023)
School: Grade 10 avail.	-0.021	0.033	-0.014
	(0.028)	(0.036)	(0.036)
Class: High share migratory background	-0.011	-0.013	-0.010
	(0.016)	(0.019)	(0.019)
Class: High share low social class	0.007	0.007	0.006
	(0.019)	(0.022)	(0.021)
State: high share general schooling	0.015	0.070***	0.019
	(0.021)	(0.025)	(0.027)
Regional vocational training market type			
Reference: Western G, rural, large secondary sector, high competition			
Eastern G: few stud., high unemploy.,	0.092*	0.071	0.094
rural, large secondary sector	(0.054)	(0.076)	(0.073)
Eastern G: few students, high unemploy.,	-0.009	-0.007	-0.009

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Continuation of Table 5.A.13

	Full sample	Red. sample	Transition incl.
rural, av. market	(0.038)	(0.042)	(0.044)
Eastern G: few students, high unemploy.,	-0.056	-0.076	-0.081
fav. market	(0.063)	(0.073)	(0.073)
Dynamic large cities, fav. market,	-0.098***	-0.121***	-0.126***
low competition	(0.033)	(0.039)	(0.039)
Dynamic large cities, urban,	-0.064**	-0.098***	-0.088***
strong large companies	(0.027)	(0.032)	(0.034)
Western G, large companies,	-0.051**	-0.055**	-0.047*
urban, av. market	(0.022)	(0.025)	(0.026)
Western G, large companies, urban,	-0.026	-0.042	-0.027
low unemploy., high competition	(0.027)	(0.033)	(0.032)
Western G, large companies, urban,	-0.190***	-0.188***	-0.187***
high unemploy.	(0.040)	(0.046)	(0.042)
Western G, low unemploy.,	-0.076***	-0.076***	-0.075**
good market, av. competition	(0.026)	(0.030)	(0.029)
Western G, rural, no large companies,	-0.029	-0.069	-0.041
low unemploy., high competition	(0.047)	(0.061)	(0.058)
Observations	3730	2980	2980

Notes: Average marginal effects of Probit estimations, controls for imputed variables included. Standard errors clustered by school in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5.A.7: Drop-out of Vocational Training Within First Year – Stepwise Addition of Covariates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Type of transition, reference: Direct transition							
Pre-voc. training	0.086***	0.055*	0.051*	0.046*	0.022	0.022	0.021
	(0.030)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.029)
Voc. school	0.088**	0.087**	0.096***	0.088***	0.070**	0.076**	0.075**
	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.035)	(0.035)
Gen. school	0.050**	0.061***	0.064***	0.059***	0.039	0.038	0.032
	(0.023)	(0.021)	(0.022)	(0.023)	(0.024)	(0.024)	(0.026)
Personal and family characteristics	no	yes	yes	yes	yes	yes	yes
grades and cognitive skills	no	no	yes	yes	yes	yes	yes
non-cognitive skills	no	no	no	yes	yes	yes	yes
career planning	no	no	no	no	yes	yes	yes
school and class characteristics	no	no	no	no	no	yes	yes
local labor market	no	no	no	no	no	no	yes
Observations	2779	2779	2779	2779	2779	2779	2779

Notes: Average marginal effects of Probit estimations. See models in Table 5.A.5 for complete list of control variables. Standard errors in parentheses clustered by school, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5.A.8: Wage during Vocational Training – Stepwise Addition of Covariates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Type of transition, reference: Direct transition							
Pre-voc. training	17.11	23.30*	31.40**	31.42**	31.24**	33.47**	35.20***
	(12.79)	(12.67)	(12.58)	(12.86)	(13.77)	(13.33)	(13.45)
Voc. school	80.72***	83.02***	80.45***	79.26***	78.42***	80.31***	80.99***
	(13.21)	(13.27)	(13.50)	(13.62)	(13.75)	(13.62)	(13.82)
Gen. school	54.89***	55.21***	54.51***	52.16***	61.10***	67.10***	78.11***
	(7.38)	(7.42)	(7.57)	(8.04)	(9.18)	(8.99)	(9.57)
Personal and family characteristics	no	yes	yes	yes	yes	yes	yes
grades and cognitive skills	no	no	yes	yes	yes	yes	yes
non-cognitive skills	no	no	no	yes	yes	yes	yes
career planning	no	no	no	no	yes	yes	yes
school and class characteristics	no	no	no	no	no	yes	yes
local labor market	no	no	no	no	no	no	yes
Observations	2165	2165	2165	2165	2165	2165	2165
R^2	0.032	0.048	0.062	0.072	0.082	0.097	0.106

Notes: See models in Table 5.A.5 for complete list of control variables. Standard errors in parentheses clustered by school, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5.A.9: Prestige of Voc. Training Occupation – Stepwise Addition of Covariates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Type of transition, reference: Direct transition							
Pre-voc. training	-0.43	-0.38	-0.01	-0.06	-0.28	-0.29	-0.23
	(0.52)	(0.52)	(0.54)	(0.54)	(0.56)	(0.57)	(0.57)
Voc. school	2.96***	2.41***	2.26***	2.05***	2.03***	1.98***	1.85***
	(0.56)	(0.56)	(0.54)	(0.55)	(0.57)	(0.55)	(0.55)
Gen. school	2.26***	1.92***	1.84***	1.56***	1.71***	1.78***	2.20***
	(0.35)	(0.36)	(0.36)	(0.37)	(0.39)	(0.41)	(0.44)
Personal and family characteristics	no	yes	yes	yes	yes	yes	yes
grades and cognitive skills	no	no	yes	yes	yes	yes	yes
non-cognitive skills	no	no	no	yes	yes	yes	yes
career planning	no	no	no	no	yes	yes	yes
school and class characteristics	no	no	no	no	no	yes	yes
local labor market	no	no	no	no	no	no	yes
Observations	2702	2702	2702	2702	2702	2702	2702
R^2	0.025	0.060	0.080	0.093	0.106	0.115	0.124

Notes: See models in Table 5.A.5 for complete list of control variables. Standard errors in parentheses clustered by school, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5.A.10: SES of Voc. Training Occupation – Stepwise Addition of Covariates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Type of transition, reference: Direct transition							
Pre-voc. training	0.00	-0.19	0.40	0.19	0.02	-0.04	0.05
	(0.71)	(0.67)	(0.69)	(0.65)	(0.68)	(0.69)	(0.69)
Voc. school	6.35***	5.01***	4.67***	3.93***	3.94***	3.90***	3.87***
	(0.92)	(0.86)	(0.84)	(0.86)	(0.88)	(0.86)	(0.87)
Gen. school	5.38***	4.53***	4.24***	3.40***	3.75***	3.66***	4.10***
	(0.53)	(0.50)	(0.50)	(0.50)	(0.51)	(0.52)	(0.55)
Personal and family characteristics	no	yes	yes	yes	yes	yes	yes
grades and cognitive skills	no	no	yes	yes	yes	yes	yes
non-cognitive skills	no	no	no	yes	yes	yes	yes
career planning	no	no	no	no	yes	yes	yes
school and class characteristics	no	no	no	no	no	yes	yes
local labor market	no	no	no	no	no	no	yes
Observations	2702	2702	2702	2702	2702	2702	2702
R^2	0.051	0.142	0.160	0.209	0.217	0.225	0.229

Notes: See models in Table 5.A.5 for complete list of control variables. Standard errors in parentheses clustered by school, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5.A.11: Average Wage of Voc. Training Occupation – Stepwise Addition of Covariates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Type of transition, reference: Direct transition							
Pre-voc. training	-11.26	18.14	49.55	41.40	28.78	35.15	40.44
	(43.70)	(37.23)	(37.24)	(36.43)	(38.27)	(38.54)	(37.53)
Voc. school	167.97***	280.09***	270.58***	239.66***	237.72***	237.57***	214.41***
	(48.30)	(47.48)	(47.08)	(46.79)	(47.41)	(45.29)	(44.28)
Gen. school	102.11***	161.44***	150.71***	115.22***	122.47***	144.93***	192.84***
	(32.79)	(29.75)	(29.03)	(29.91)	(32.37)	(34.69)	(33.84)
Personal and family characteristics	no	yes	yes	yes	yes	yes	yes
grades and cognitive skills	no	no	yes	yes	yes	yes	yes
non-cognitive skills	no	no	no	yes	yes	yes	yes
career planning	no	no	no	no	yes	yes	yes
school and class characteristics	no	no	no	no	no	yes	yes
local labor market	no	no	no	no	no	no	yes
Observations	2694	2694	2694	2694	2694	2694	2694
R^2	0.009	0.238	0.258	0.279	0.287	0.298	0.353

Notes: See models in Table 5.A.5 for complete list of control variables. Standard errors in parentheses clustered by school, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5.A.12: Level of Satisfaction with Voc. Training – Stepwise Addition of Covariates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Type of transition, reference: Direct transition							
Pre-voc. training	-0.99***	-0.95***	-0.96***	-0.93***	-0.91***	-0.93***	-0.96***
	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)
Voc. school	-0.81***	-0.81***	-0.81***	-0.76***	-0.74***	-0.75***	-0.77***
	(0.13)	(0.13)	(0.13)	(0.13)	(0.14)	(0.14)	(0.14)
Gen. school	-0.57***	-0.57***	-0.57***	-0.54***	-0.52***	-0.55***	-0.60***
	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)	(0.08)	(0.09)
Personal and family characteristics	no	yes	yes	yes	yes	yes	yes
grades and cognitive skills	no	no	yes	yes	yes	yes	yes
non-cognitive skills	no	no	no	yes	yes	yes	yes
career planning	no	no	no	no	yes	yes	yes
school and class characteristics	no	no	no	no	no	yes	yes
local labor market	no	no	no	no	no	no	yes
Observations	2303	2303	2303	2303	2303	2303	2303
R^2	0.042	0.053	0.059	0.104	0.107	0.099	0.114

Notes: See models in Table 5.A.5 for complete list of control variables. Standard errors in parentheses clustered by school, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

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Selbstständigkeitserklärung

Ich erkläre, dass ich die vorliegende Arbeit selbstständig und nur unter Verwendung der angegebenen Literatur und Hilfsmittel angefertigt habe.

Ich bezeuge durch meine Unterschrift, dass meine Angaben über die bei der Abfassung meiner Dissertation benutzten Hilfsmittel, über die mir zuteil gewordene Hilfe sowie über frühere Begutachtungen meiner Dissertation in jeder Hinsicht der Wahrheit entsprechen.

Mannheim, 5. Mai 2020 Annette Hillerich-Sigg